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# ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 215

DATE: Thursday, June 14, 1990

BEFORE:

A. KOVEN, Chairman

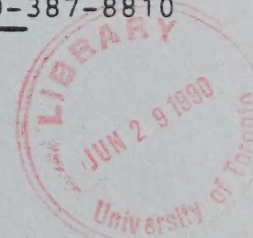
E. MARTEL, Member

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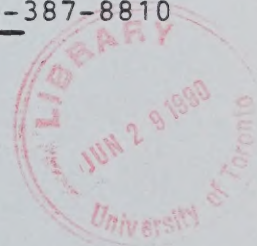
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL  
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR  
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental  
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental  
Assessment for Timber Management on Crown  
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the  
Honourable Jim Bradley, Minister of the  
Environment, requiring the Environmental  
Assessment Board to hold a hearing with  
respect to a Class Environmental  
Assessment (No. NR-AA-30) of an  
undertaking by the Ministry of Natural  
Resources for the activity of timber  
management on Crown Lands in Ontario.

-----

Hearing held at the offices of the Ontario  
Highway Transport Commission, Britannica  
Building, 151 Bloor Street West, 10th Floor,  
Toronto, Ontario, on Thursday, June  
14th, 1990, commencing at 8:30 a.m.


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VOLUME 215

BEFORE:

MRS. ANNE KOVEN  
MR. ELIE MARTEL

Chairman  
Member



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I N D E X   O F   P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>JOSEPH V. RODRICKS,</u> <u>NANCY J. RACHMAN, Resumed</u>	38711
Continued Cross-Examination by Mr Castrilli	38711
Cross-Examination by Ms. Kleer	38855
Cross-Examination by Mr. Freidin	38915
Re-Direct Examination by Mr. Cassidy	38953
SUBMISSIONS	38955



(v)

I N D E X       O F       E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
1249	Record of Decision re Final Environmental Impact Statement entitled: Managing Competing and Unwanted Vegetation, produced by U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, November, 1988.	38713
1250	Two-page excerpt from document entitled: A Guide to Conducting Vegetatin Management Projects in the Pacific Northwest region, produced by USDA Forest Service, Forest Pest Management, Pacific Northwest Region.	38716
1251	Excerpt of Section 6 entitled: Data for Evaluatin of Human Epidemiology (Appendix H on human health risk assessment) from document entitled: United States Department of Agriculture, United States Forest Service, Pacific Northwest Region, dated November, 1988.	38721
1252	IARC Monographs, Supplement 7, 1987, excerpts with respect to chlorophenoxy herbicides.	38760
1253	Memorandum dated December 5, 1989 from James B. Reid, Associate Director, Audit Enforcement Section, Pestsicides Directorate, Agriculture Canada.	38835
1254	Document entitled: IARC Monograph, Supplement No. 7, 1987 excerpts re 1,4-dioxane.	38840





Index of Exhibits (Cont'd)

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
1255	Excerpts from 40 CFR 158.340.	38872
1256	Three-page memorandum entitled: Sumithion, Toxicology Chapter of the Registration Standard, dated May 8, 1987, authored by EPA.	38884
1257	Document entitled: Toxicology Profile authored by EPA.	38886





1 ---Upon commencing at 8:30 a.m.

2 MADAM CHAIR: Thank you, be seated.

3 Good morning, Dr. Rodricks, Dr. Rachman.

4 JOSEPH V. RODRICKS,  
5 NANCY J. RACHMAN, Resumed

6 MR. CASTRILLI: Good morning, Madam  
7 Chair, by my watch--

8 MADAM CHAIR: Good morning, Mr.  
9 Castrilli.

10 MR. CASTRILLI: --I thought I had 30  
11 seconds. I did find it for you.

12 CONTINUED CROSS-EXAMINATION BY MR. CASTRILLI:

13 Q. Good morning. Dr. Rachman, yesterday  
14 morning we were discussing various forest services in  
15 the United States, or actually I guess we were  
16 discussing one at that time.

17 You've been provided with a copy of a  
18 further Record of Decision from another regional forest  
19 service in the Pacific northwest; is that right?

20 DR. RACHMAN: A. You're referring to  
21 exhibit --

22 Q. No, it's not an exhibit yet.

23 A. Oh, I'm sorry.

24 Q. It's the Record of Decision--

25 A. Record of Decision.

1 Q. --for the United States Department of  
2 Agriculture, U.S. Forest Service.

3 A. Yes.

4 Q. No, not that one. It looks like  
5 this, I'm sorry.

6 A. Mr. Castrilli--

7 Q. It's a white cover.

8 A. --I have indeed been provided with  
-9 that document. For some reason I cannot put my hands  
10 on it.

11 Q. Perhaps Mr. Cassidy could loan you  
12 his copy.

13 A. That would be very much appreciated.

14 Q. Actually I probably have extra  
15 copies.

16 MR. CASSIDY: Good. Can I have one.

17 MR. CASTRILLI: Madam Chair, I'm ready to  
18 proceed.

19 I'd like to make this the next exhibit.  
20 It's entitled: United States Department of Agriculture,  
21 U.S. Forest Service Pacific Northwest Region, November,  
22 1988 and it's a Record of Decision from the Final  
23 Environmental Impact Statement entitled: Managing  
24 Competing and Unwanted Vegetation, and it's a decision  
25 of the regional forester for the Pacific Northwest

1           Region. The actual date of the decision is December 8,  
2           1988. And I would ask that this be made the next  
3           exhibit.

4                       MADAM CHAIR: That's Exhibit 1249.

5                       MR. CASTRILLI: (handed)

6           ---EXHIBIT NO. 1249: Record of Decision re Final  
7                                   Environmental Impact Statement  
8                                   entitled: Managing Competing and  
9                                   Unwanted Vegetation, produced by  
                                  U.S. Department of Agriculture,  
                                  Forest Service, Pacific Northwest  
                                  Region, November, 1988.

10                      MR. CASTRILLI: Q. Dr. Rachman, this  
11           decision of the U.S. Forest Service for the Pacific  
12           Northwest Region indicates that a further regional  
13           forest service in the United States has made an  
14           environmentally health related environmental risk  
15           decision with respect to 2,4-D use in the national  
16           forests for the States of Oregon and Washington.

17                      Is that your understanding?

18                      DR. RACHMAN: A. Mr. Castrilli, I have  
19           to say that I do not know the exact basis for this  
20           decision. To my knowledge these environmental impact  
21           statements and these decisions by the regional Forest  
22           Service people in the United States fall under certain  
23           regulations. I'm not familiar with those regulations.

24                      Those regulations prescribe how the  
25           evaluations should be done, what values should be



1 considered in making the decision, how to go about  
2 determining what level of risk is acceptable, and  
3 because I'm unfamiliar with those regulations and also  
4 with the way these decisions were reached, I really  
5 feel unqualified to comment on this document and the  
6 significance of this decision.

7 Q. Well, I'm not going to take you  
8 outside your expertise. I'd like to refer you to page  
9 6 of Exhibit 1249.

10 We are looking at the second full  
11 paragraph on the page. I'll just read the whole  
12 paragraph, or portion of the paragraph:

13 "Three specific herbicides (of the  
14 sixteen that were evaluated in..." the  
15 Environmental Impact Statement's, "...risk  
16 assessment) will not be used: ...", and  
17 they identify the three of them. None of the three are  
18 of interest or concern in these proceedings.

19 "One herbicide, 2,4-D, will be used only  
20 as a last resort."

21 And then the decision goes on to note  
22 that:

23 "The use of other herbicides requires  
24 using special mitigation measures  
25 summarized in this Record of Decision

1                   and detailed in Chapter IV of the EIS,"  
2           which we don't have. I just refer you to the -- I'm  
3           only interested in 2,4-D for the purposes of this  
4           discussion. Refer you to paragraph 5 of the same page,  
5           page 6. I'll just read that into the record:

6                   "With respect to 2,4-D, studies about its  
7           cancer causing potential have conflicting  
8           results--some show a positive  
9           association with cancer, others do not.  
10          Although the studies completed to date do  
11          not support a conclusion that 2,4-D  
12          causes cancer, the question remains  
13          unresolved. In reaching the decision to  
14          use 2,4-D as a last resort, I also  
15          considered its demonstrated potential for  
16          adverse neurotoxic, reproductive and  
17          Developmental effects."

18                   Were you aware, Dr. Rachman, that the  
19          Pacific Northwest Region of the U.S. Forest Service was  
20          only prepared to use 2,4-D as a last resort?

21                   A. Not before reading this document, no.

22                   Q. Now, I believe you've also been  
23          provided with an excerpt from a document entitled: A  
24          Guide to Conducting Vegetative Management Projects in  
25          the Pacific Northwest Region. It's a document of about

1 two pages with that cover on it.

2 MADAM CHAIR: Does the Board have that,  
3 Mr. Castrilli?

4 MR. CASTRILLI: No, no. I'm going to make  
5 it the next exhibit.

6 DR. RACHMAN: Mr. Castrilli, I have not  
7 had an opportunity to review this document. We've  
8 somehow -- I'd be happy to take a look at it right now.

9 MR. CASTRILLI: All right. Well, it's  
10 only -- the only reason why I refer it to you at all  
11 because it simply elaborates on what the regional  
12 forester meant by the term last resort.

13 So, Madam Chair, I'd ask this be made the  
14 next exhibit. It's really companion piece to the  
15 Record of Decision.

16 MADAM CHAIR: Do you want a separate  
17 exhibit number for it, Mr. Castrilli?

18 MR. CASTRILLI: Yes, please.

19 MADAM CHAIR: That's Exhibit No. 1250.

20 MR. CASTRILLI: (handed)

21 ---EXHIBIT NO. 1250: Two-page excerpt from document  
22 entitled: A Guide to Conducting  
23 Vegetation Management Projects in  
24 the Pacific Northwest region,  
produced by USDA Forest Service,  
Forest Pest Management, Pacific  
Northwest Region.

25 MR. CASSIDY: Perhaps it can be noted for



1 the record, Madam Chair, that this does not appear to  
2 be obviously the full version but simply an excerpt.

3 MR. CASTRILLI: Well, yes, I'm sorry.  
4 This is an excerpt of a much larger document. The only  
5 relevant portions dealing with 2,4-D are the pages I've  
6 made and are now Exhibit 1250. If Mr. Cassidy would  
7 like to look at the full document, I have a copy of it  
8 here.

9 I would also note for the record, Madam  
10 Chair, that this document, although it doesn't have a  
11 date on it, my understanding is it is 1990 publication  
12 date.

13 MADAM CHAIR: Do you want to confirm  
14 that, Mr. Cassidy?

15 MR. CASSIDY: Yes, I've asked to take a  
16 look just briefly at the full document.

17 MR. CASTRILLI: (handed)

18 MR. CASSIDY: Thank you.

19 MR. CASTRILLI: And if there are any  
20 other portions of the document that Mr. Cassidy would  
21 like made exhibits, I would be content to do that from  
22 the document that I've just filed.

23 DR. RACHMAN: This is now Exhibit 1250,  
24 is that correct, Madam Chair?

25 MADAM CHAIR: Yes, it is.

1 MR. CASTRILLI: Q. Dr. Rachman, just  
2 referring you to then Exhibit 1250, page -- sorry, the  
3 two pages I have attached are I-23 and I-24, and the  
4 heading is Alternatives Using the Herbicide 2,4-D, and  
5 the beginning paragraph notes that:

6 "One herbicide, 2,4-D, requires special  
7 consideration and analysis when  
8 developing alternatives."

9 And then referring you to page I-24,  
10 which is the portion I meant to focus your attention  
11 on, you will see that on this page a portion of the  
12 Record of Decision, page 6, has been reproduced in the  
13 guide and I've, I believe, read that into the record  
14 for you.

15 And then the companion document referred  
16 to in the guide is something called a mediated  
17 agreement which simply adds some meaning for the reader  
18 as to what the regional forester means by the term  
19 '2,4-D is a remedy of last resort, and that's the  
20 portion I wanted to read into the record.

21 "...Of the thirteen herbicides available  
22 for use, one of them, 2,4-D, is to be  
23 used only as a last resort. This means  
24 that 2,4-D can be used only if all other  
25 methods for managing the competing or

1                   unwanted vegetation are ineffective or  
2                   too expensive."

3                   Let me just restate the question I  
4 believe I asked earlier and elicited an answer from you  
5 on.

6                   You were not aware that 2,4-D was only to  
7 be used in the Pacific Northwest as a last resort--

8                   DR. RACHMAN: A. No, I wasn't.

9                   Q. --prior to this morning; is that  
10 right?

11                  A. That's right.

12                  Q. Can you advise the Board, Dr.  
13 Rachman, whether United States Environmental Protection  
14 Agency has placed a last resort use restriction on the  
15 use of 2,4-D?

16                  A. They have not.

17                  Q. Thank you. And do you happen to know  
18 whether 2,4-D is now being used in the Pacific  
19 Northwest national forests?

20                  A. I really cannot speak to that  
21 question at all.

22                  Q. That's fine, thank you.

23                  Dr. Rodricks, yesterday you will recall  
24 during your examination-in-chief you noted that with  
25 respect to 2,4-D there have been quite a lot of

1 epidemiologic studies conducted on it. Was my  
2 understanding correct?

3 DR. RODRICKS: A. Well, it and other  
4 herbicides, other phenoxy herbicides, yes.

5 Q. All right, thank you. Yesterday  
6 afternoon I provided to you a review which was  
7 conducted as part of the U.S. Forest Service Pacific  
8 Northwest Region's review of epidemiologic studies  
9 conducted at least prior to the date of the report  
10 itself entitled: Managing Competing and Unwanted  
11 Vegetation, and what I provided to you was Section 6 of  
12 Appendix H which dealt with the data respecting human  
13 epidemiology.

14 Do you have that document before you?

15 A. I guess I could find it.

16 MR. CASTRILLI: Madam Chair, I'd like to  
17 make this the next exhibit. It's an excerpt of a  
18 document entitled: United States Department of  
19 Agriculture, United States Forest Service, Pacific  
20 Northwest Region. The cover of the document is  
21 November, 1988.

22 I note that the inside front cover which  
23 I've included appears to indicate that the report was  
24 prepared in August, 1988. I frankly don't know or  
25 understand the distinction between the two dates, but



1 in any event, it appears to have two dates.

2 And what I've included is the last  
3 section of the report entitled: Section 6, Data for  
4 Evaluation of Human Epidemiology, which is an excerpt  
5 from Appendix H on human health risk assessment  
6 qualitative.

7 A phone book size document by any stretch  
8 of the imagination is what this is only a very small  
9 portion of, but this is the entirety of the document  
10 with respect to epidemiology.

11 Have you assigned an exhibit number to  
12 this one?

13 MADAM CHAIR: This will be Exhibit 1251.

14 MR. CASTRILLI: Thank you. (handed)

15 MADAM CHAIR: Thank you.

16 ---EXHIBIT NO. 1251: Excerpt of Section 6 entitled:  
17 Data for Evaluation of Human  
18 Epidemiology (Appendix H on human  
19 health risk assessment) from  
20 document entitled: United States  
Department of Agriculture, United  
States Forest Service, Pacific  
Northwest Region, dated November,  
1988.

21 MR. CASTRILLI: Q. Dr. Rodricks, let's  
22 begin with page H-123 of Exhibit 1251.

23 DR. RODRICKS: A. Yes.

24 Q. And we're looking down at the bottom  
25 of the page the Scope of the Studies, and the report

1 indicates that the studies presented here all involve  
2 phenoxy acid herbicides and, as I believe you've  
3 indicated in your testimony-in-chief - and just let me  
4 confirm this very quickly - 2,4-D is a member of that  
5 particular chemical family; is that right?

6 A. That's right.

7 Q. I'd like to refer you to page H-124,  
8 this is still under the general heading of the Scope of  
9 the Studies, I'll just read a portion of this into the  
10 record, beginning at the top of the page:

11 "Most of the studies involved mixed  
12 exposure to various phenoxy herbicides  
13 chlorophenols and/or other chemicals.

14 Exposure to TCDD...", and that would be  
15 the full title 2,3,4,7,8-TCDD Doctor?

16 A. I assume that's the one they're  
17 referring to, yes.

18 Q. "...not associated with 2,4-D or  
19 2,4-DP is of concern in these studies,  
20 however, several studies involve only  
21 minimal confounding with dioxins. These  
22 include the following:"

23 The first one listed is:

24 "Lynge...", L-y-n-g-e,

25 "...1985, a cohort study of workers

1 exposed primarily to 2,4-D and other  
2 phenoxy herbicides not contaminated with  
3 TCDD; Erikson et al. 1981, a case  
4 control study independently analysed  
5 for non-2,4,5-T exposure; Hoar..."

6 that's H-o-a-r,

7 "...et al. 1987."

8 I actually believe, Dr. Rodricks, they  
9 must be referring to the 1986 report. Is that your  
10 understanding?

11 A. I would assume that is the Kansas  
12 study of '86.

13 Q. And my understanding it's the Kansas  
14 study they're referring to as they reference it at the  
15 back as Hoar, 1986.

16 A. Yes.

17 Q. Thank you.

18 "A case control study independently  
19 analysed for 2,4-D use."

20 I just want to move on to the last  
21 paragraph in this section before I ask you a number of  
22 questions. Moving down to the last paragraph on that  
23 page:

24 "The concern about confounding cannot be  
25 overcome in many of these studies,

1                   however, 2,4-D and 2,4-DP are  
2                   contaminated with chlorinated dioxins  
3                   other than TCDD or may have toxic effects  
4                   of their own. The assumption that all  
5                   the toxicity of phenoxy herbicides is  
6                   only associated with TCDD exposure does  
7                   not necessarily follow and there is  
8                   evidence that other dioxins may be  
9                   important factors."

10                  And the reference there is to Woods, 1987  
11                  which I believe, Madam Chair, is now Exhibit 1247 in  
12                  these proceedings.

13                  "To ignore the observed human health  
14                  effects of this group of herbicides based  
15                  upon the assumption that all effects are  
16                  Attributable to TCDD would be overly  
17                  simplistic and not consistent with a  
18                  conservative approach to assessing human  
19                  health."

20                  Just stopping there, Dr. Rodricks, do you  
21                  agree with the assessment in the last paragraph on that  
22                  page, H-124?

23                  A. Well, if they are saying that if we  
24                  make the assumption that if there's no TCDD in a  
25                  product there's no concern about it, I certainly agree



1 with that, that's the import here.

2 Q. I'm not sure that that's in fact the  
3 import I take from the paragraph. Let me return you  
4 to -- let's break this paragraph down into parts.

5 A. Well, they say that it would be wrong  
6 to assume that whatever toxicity has been observed with  
7 phenoxy herbicides in animal studies or in human  
8 studies may be in part due to dioxin contaminants or in  
9 part due to phenoxies. It would be wrong to conclude  
10 that they're all due to TCDD. I guess that's what this  
11 says.

12 Q. Do you agree with that assessment?

13 A. Sure.

14 Q. All right.

15 A. In fact the animal studies on 2,4,5-D  
16 itself don't suggest any TCDD-like activity.

17 Q. Sorry, did you say 2,4,5-D?

18 A. 2,4-D.

19 Q. Okay, thank you.

20 A. Do not suggest -- too many --

21 Q. You're right.

22 A. Too many acronyms. The animal  
23 studies on 2,4-D do not suggest any significant  
24 contribution from dioxin contaminants to the toxicity  
25 observed.

1 Q. When you say dioxin contaminants, do  
2 you mean TCDD--

3 A. Any.

4 Q. --or do you mean any of the dioxin  
5 chemical family?

6 A. Well, TCDD, it's all we know --

7 Q. It's just one of 75.

8 Q. But it's all we know clearly the most  
9 toxic, most toxic by far.

10 Q. All right. Now, the second sentence  
11 in that paragraph -- sorry, let me go back to the  
12 second sentence.

13 "2,4-D and 2,4-D --", let's just ignore  
14 2,4-DP so that we keep the number of acronyms on the  
15 record to a minimum. I'll just use 2,4-D and you'll  
16 know we're speaking about both of them.

17 "2,4-D is contaminated with chlorinated  
18 dioxins other than TCDD or may have toxic  
19 effects of their own."

20 Is that an assessment you agree with, is  
21 that a statement you agree with?

22 A. Well, there are other chlorinated,  
23 dichlorinated dioxins particularly in 2,4-D. There is  
24 some limit - I forget what it is on the amount  
25 present - like all materials, they have some toxicity

1 but, based on the evidence we have, they are very much  
2 less toxic than TCDD. So, yes, they will have some  
3 toxic effects on their own.

4 Q. Thank you. The next sentence:

5 "The assumption that all the toxicity of  
6 phenoxy herbicides is only associated  
7 with TCDD exposure does not necessarily  
8 follow and there is evidence that other  
9 dioxins may be important factors."

10 And the reference there is to Woods,  
11 1987. Do you agree with that assessment?

12 A. Well, I don't know what that evidence  
13 is. As we discussed yesterday, Woods postulated or  
14 speculated about the possible role of dioxins as one  
15 explanation for the difference in his observations from  
16 those in Sweden, but I wouldn't exactly call that  
17 evidence.

18 Q. Well, Dr. Rodricks, as I recall, when  
19 Woods made those statements in his paper he was  
20 referring to other documents, he wasn't just simply  
21 speculating in the air and, as I recall, you and I had  
22 a discussion yesterday about whether you had reviewed  
23 at least one of those other documents and, as I recall,  
24 you told me you hadn't. Have you reviewed it since  
25 last night?

1                   A. Well, this sentence, no, but this  
2 sentence says that there is evidence that other dioxins  
3 may be important factors; that is, important I assume  
4 in the toxicity of phenoxy herbicides, and I don't read  
5 the Woods document as providing that evidence, that  
6 they are contributing to the toxicity of phenoxy  
7 herbicides.

8                   Q. Woods did talk about not only  
9 toxicity but he also, as I recall, was really focusing  
10 his observations on exposures.

11                  A. Exposure, that's correct.

12                  Q. And would you agree with me that  
13 clearly Woods indicated that there was exposure, based  
14 on the information available to him, not only to the  
15 occupationally exposed population but to the general  
16 population and that he referred in particular to  
17 dioxins as well as furans. Do you recall that?

18                  A. Yes, he referred to them, but what he  
19 was trying to show is that there may be some background  
20 level of dioxins in people not occupationally exposed  
21 and there certainly is, and that background level of  
22 dioxins, a range of dioxins, might not exist in  
23 Sweden - I don't know why it wouldn't - such that this  
24 might be an explanation for the difference in relative  
25 risks observed in his study and the Sweden studies.

1 But I don't read that as evidence that dioxins are  
2 contributing to toxicity.

3 Q. I'm sorry. What evidence do you rely  
4 upon for the conclusion that dioxins do not contribute  
5 to 2,4-D's toxicity?

6 A. Well, the animal evidence -- the only  
7 clear evidence we have of toxicity comes from animal  
8 studies except for a few accidental exposures in  
9 humans, and 2,4-D has some toxicity of its own. It  
10 affects organs and systems that I do not know to be  
11 affected by dioxins and, of course, there is no  
12 evidence from animal studies of sort of carcinogenicity  
13 one sees with TCDD which is, in rats at least, an  
14 extremely potent carcinogen.

15 Q. Well --

16 A. I can't conclude that dioxins  
17 contribute nothing to the toxicity of 2,4-D, we have  
18 tests on 2,4-D. What I'm saying is that the major  
19 effects one sees in the kidney, in the blood do not --  
20 are not associated with dioxins, to my knowledge.

21 Q. And as I recall, Dr. Rodricks, from  
22 the exhibit you filed yesterday which was the Federal  
23 Register for October, 1989, the U.S. EPA is in fact  
24 requiring the retesting - sorry, with respect to the  
25 animal tests now, not the epidemiologic tests.



1 A. Right.

2 Q. The U.S. EPA requiring that those  
3 long-term studies be redone.

4 A. That's correct.

5 Q. Because as far as they're concerned  
6 the existing database, animal database with respect to  
7 2,4-D is not adequate to determine one way or the  
8 other, or as I think in that exhibit, the maximum  
9 tolerated dose had not been achieved and, therefore,  
10 they were not prepared to rely on those studies for a  
11 conclusion that 2,4-D was negative with respect to  
12 carcinogenicity; is that right?

13 A. That was EPA's view, that's correct.

14 Q. All right, thank you.

15 A. Not the view of the Ministry of the  
16 Environment panel, they thought the rat study was  
17 adequate and the mouse study probably not.

18 Q. Yes, that's right, that's what I  
19 recall you're indicating, that that report indicates.

20 The last sentence on page H-124:

21 "To ignore the observed human health  
22 effects of this group of herbicides based  
23 upon the assumption that all effects are  
24 attributable to TCDD would be overly  
25 simplistic and not consistent with a

1 conservative approach to assessing human  
2 health."

3 Do you agree with that assessment, Dr.  
4 Rodricks?

5 A. Well, I think -- that is the question  
6 I thought I answered initially; that is, if you  
7 assume -- if one would make the assumption that unless  
8 TCDD is present there's no concern about toxicity, that  
9 would be just bad science. I don't know whether it's  
10 conservative or not, it's just bad science. So to that  
11 extent I agree with the sentence.

12 Q. All right, thank you.

13 A. In other words, if there is no TCDD  
14 in 2,4-D does not mean that you simply drop concern,  
15 you have to look at the toxicity of the material  
16 itself.

17 Q. All right, thank you. I'd like to  
18 refer you to page H-125. This is under the heading  
19 Evaluations of Association.

20 A. Yes.

21 Q. I want to read the first two  
22 paragraphs into the record.

23 "The following evaluations are based upon  
24 all the studies described above and  
25 listed in the table below."

1                   And they have all been contained in what  
2           is now Exhibit 1251 ....

3                   "Due to the fact that very few of the  
4           studies evaluated exposure to 2,4-D or  
5           2,4-DP separately from other associated  
6           exposures the extension of these findings  
7           to these herbicides must be done with  
8           care. Nevertheless, those studies which  
9           specifically looked at 2,4-D exposure did  
10          not differ greatly in results from the  
11          other studies. There is no evidence here  
12          that 2,4-D is any less or more toxic than  
13          other phenoxy herbicides. A cautious  
14          observer would have to conclude that the  
15          evidence is suggestive of some  
16          carcinogenic effect."

17                  Do you agree with that assessment, Dr.  
18          Rodricks?

19                  A. In part. With respect to the  
20          ultimate conclusion I would simply qualify it the way  
21          the MOE Panel qualified it, or the Harvard Review  
22          Panel; that is, that it's suggestive with respect to  
23          non-Hodgkin's lymphoma. I might also add that a causal  
24          relationship has not been established, and I would be a  
25          little more careful noting that most of the studies

1 point to phenoxy herbicides do not cleanly separate  
2 2,4-D.

3 The Woods study does not show an  
4 association of 2,4-D when that was singled out, where  
5 the Hoar study does show association with 2,4-D when  
6 that was singled out, as did I believe one of the  
7 earlier Swedish studies.

8 Q. Okay, thank you.

9 A. So I would just qualify this a little  
10 bit.

11 Q. That's fine. I would like to -- this  
12 section called Evaluations of Association deals with  
13 seven or eight associations - I don't want to deal with  
14 all of them - but what it overall indicates is that an  
15 association between exposure to the phenoxy herbicides,  
16 including 2,4-D, and development of cancer is  
17 suggested, and these authors point to at least five  
18 types of cancer. I want to go through the five types  
19 they identify: lung cancer, stomach cancer, Hodgkin's  
20 Disease, non-Hodgkin's lymphoma and soft tissue  
21 sarcoma.

22 Let me begin with the lung cancer at the  
23 bottom of H-125. The authors state:

24 "Based upon fairly small studies there is  
25 a suggestion that exposure to phenoxy

1 acids and/or dioxins may cause lung  
2 cancer. One difficulty of applying these  
3 findings to the use of 2,4-D and 2,4-DP  
4 is the question of the role of the TCDD  
5 dioxin. It is very difficult to clearly  
6 separate these exposures, however, the  
7 only statistically significant increase  
8 in lung cancer was reported by Lynge, a  
9 study with only minor exposure to 2,4,5-T  
10 and the TCDD dioxin."

11 Just stopping there, Dr. Rodricks, do you  
12 agree with that assessment?

13 A. Well, I guess it depends what you  
14 mean by suggestion; if you mean that there is a  
15 statistical association in one study, that seems pretty  
16 strong. I would call this inadequate to evaluate in  
17 IARC terminology.

18 Q. And that would be because of the  
19 reliance on predominantly one study?

20 A. Suggestion -- pardon? And it doesn't  
21 show up in others as pointed out in their table. These  
22 are all cohort studies and it's -- and I don't really  
23 make very much of this. I don't know anyone else who  
24 has considered this to be even limited evidence of  
25 carcinogenicity.



1 Q. All right. Let's deal with stomach  
2 cancer on the bottom of page H-125:

3 "Based upon very small studies there is a  
4 suggestion that exposure to phenoxy acid  
5 and/or dioxins may cause stomach cancer."

6 Just stopping there. Do you agree with  
7 that assessment?

8 A. Again, suggestion means you have a  
9 statistical association in one of several studies. I  
10 mean, I hardly find that suggestive, but that's all you  
11 have in this particular case, one of the earlier  
12 Swedish studies.

13 It depends what they mean by the word. I  
14 wouldn't use the word suggestive evidence, I would  
15 simply say, in one of several studies. They're cohort  
16 studies, they tend to be small studies, but in only one  
17 of these is there a statistical association found. I'd  
18 leave it at that.

19 Q. So would it be fair to say there is  
20 some evidence that exposure to phenoxy herbicides  
21 and/or dioxins may cause stomach cancer on the basis of  
22 the one study?

23 A. No, that's too strong.

24 Q. Too strong, All right. Let's look at  
25 Hodgkin's Disease on page H-126. The authors state:

1 "Several case control studies have  
2 looked specifically at the occurrence of  
3 Hodgkin's Disease and exposure to phenoxy  
4 herbicides. Two studies (Hardell,  
5 Erikson et al. 1979 and Hardell and  
6 Benson, 1983) both done in Sweden on  
7 separate populations, reported  
8 statistically significant five-fold  
9 risks. A recent study in the U.S.  
10 (Hoar, Blair 1986)...", that's the Kansas  
11 study,

12 "...found no excess risk. The  
13 differences for this disparity is not  
14 clear. The studies all appear to have  
15 sufficient quality to be given  
16 credibility. Given the variability of  
17 the data, we conclude that the  
18 possibility of risk for Hodgkin's Disease  
19 with exposure to phenoxy herbicides has  
20 been raised and should be of concern."  
21 Just stopping there, Dr. Rodricks, is  
22 that an assessment you agree with?

23 A. Possibility of risk for Hodgkin's  
24 Disease is suggested from one study, not been repeated  
25 in others. I would leave it at that.

1                   Again, my assessment continues to match  
2                   that of the MOE. I don't see any basis to disagree  
3                   with the MOE Panel.

4                   Q. With respect to Hodgkin's Disease?

5                   A. Yes.

6                   Q. All right. Turning to non-Hodgkin's  
7                   lymphoma, to the middle of page H-126:

8                   "Several case control studies have looked  
9                   specifically at the occurrence of  
10                  non-Hodgkin's lymphoma and exposure to  
11                  phenoxy herbicides. Two studies, one in  
12                  Sweden (Hardell, Erikson, 1981) and one  
13                  in the U.S...", again the Kansas study,  
14                  "...reported statistically significant  
15                  five to six-fold risks. A recent study  
16                  in New Zealand (Pierce and Smith, 1986)  
17                  found a non-significant mild increase  
18                  of risk around 1.4 fold. The authors of  
19                  the New Zealand study felt that their  
20                  findings were not consistent with the  
21                  other studies because their population  
22                  was likely to have high exposure. Given  
23                  the variability of the data, we conclude  
24                  that the possibility of risk for  
25                  non-Hodgkin's lymphoma with exposure to

1                   phenoxy herbicides has been raised and  
2                   should be of concern."

3                   Just stopping there, Dr. Rodricks. Is  
4                   that an overall assessment you agree with, particularly  
5                   the last paragraph?

6                   A. Well, I think I 'd be a little careful  
7                   with the words. They're using possibility of risk here  
8                   and suggestion earlier. I would sort of turn those  
9                   around.

10                  The lung cancer shows a single sort of  
11                  statistical association and nothing more; the same with  
12                  the stomach cancer. That to me signals virtually no  
13                  evidence.

14                  With respect to the non-Hodgkin's  
15                  lymphoma, I agree with the MOE, that there is what they  
16                  call limited evidence for phenoxy herbicide, in using  
17                  the language of the International Agency for Research  
18                  on Cancer, but it hasn't risen to a causal relationship  
19                  yet, and that's another thing I would add to this,  
20                  otherwise I agree. They missed putting in the citation  
21                  to Woods by the way.

22                  MR. MARTEL: Excuse me?

23                  DR. RODRICKS: As you recall, they missed  
24                  putting in here a citation to the Woods paper I  
25                  mentioned yesterday, I see that. I guess this must

1 have been prepared before -- well, clearly before the  
2 Saskatchewan study. I don't know why they didn't put  
3 the Woods result in here.

4 MR. MARTEL: Can I ask a question then.  
5 What do you do if there is a suggestion, do we wait for  
6 latency period to count up the bodies, or do we error  
7 on the side of being conservative?

8 DR. RODRICKS: Well, that's one reason.  
9 My general preference is to make sure we have good  
10 animal data, because you can get that ahead of human  
11 exposure, and base assessments on that. The animal  
12 data we have so far does not suggest a significant  
13 risk.

14 There are these suggestions here from  
15 human studies, but I guess whether you want to take  
16 suggestive evidence - considering the fact that all of  
17 these effects might be due to something else, that's  
18 still a possibility; might be due to 2,4-D, might be  
19 due to something else, other phenoxies or other things  
20 altogether - and act on that basis, I think is a policy  
21 judgment.

22 I still take some comfort from the animal  
23 data we have so far, even though we're going to be --  
24 not going to see the results of new studies now for  
25 another I guess two or three years.



1 MR. CASTRILLI: Q. Just moving to the  
2 bottom of the page H-126, Dr. Rodricks, this is a  
3 lengthy portion dealing with soft tissue sarcoma. I  
4 don't wish to read the entirety of the paragraph into  
5 the record.

6 In the last paragraph on page H-127  
7 dealing with soft tissue sarcoma, there is a passage I  
8 do want to refer you to. It's the next to last  
9 sentence in that final paragraph under the Soft Tissue  
10 Sarcoma heading and it states:

11 "Both case control and cohort studies in  
12 various countries have found associations  
13 with STS and phenoxy acid exposure."

14 Just stopping there. Do you agree with  
15 that assessment or that statement?

16 DR. RODRICKS: A. Well, if it would also  
17 say that there are also case control studies, cohort  
18 studies that have not found associations, we have both  
19 kinds of outcomes.

20 Q. All right. So you agree with the  
21 statement subject to the caveat?

22 A. It's incomplete. I mean, you've got  
23 to describe all of the evidence. And again, in this  
24 whole section they have missed the Woods study and  
25 certain of the worker studies that dealt with 2,4-D,

1           they just don't reference them.

2                       I don't know whether that's a problem  
3 with time here or not. This is November, 1988. Woods  
4 was -- I thought they mentioned Woods in their tables,  
5 they don't mention it -- yeah, they do, but for some  
6 reason they don't mention it in the text. I don't know  
7 why.

8                       As you recall, Woods looked at STS and  
9 NHL both.

10                      Q. I was just checking the bibliography  
11 because I thought I saw it as well.

12                      A. Yes, it's in their tables.

13                      MR. FREIDIN: There is reference on H-124  
14 in the fifth paragraph, second last citation.

15                      MR. CASTRILLI: Yes, that's right.  
16 That's actually one of the passages I read into the  
17 record.

18                      Q. So they deal with it in their  
19 overview. I just refer you to the bottom of H-127  
20 under the heading Summary of Cancer Associations, and  
21 the authors state:

22                               "Suggestions of association with at least  
23 five types of cancer have been found in  
24 the epidemiology literature. Each of the  
25 five cancers has had both statistically

1                   significant associations in some studies  
2                   and negative findings in others. While  
3                   there is no conclusive demonstration of  
4                   any individual association, the  
5                   suggestion is that phenoxy herbicides in  
6                   some way initiate or promote cancers and  
7                   that this is done at a level of exposure  
8                   experienced in various work settings".

9                   Is that a conclusion that you agree with,  
10                  Dr. Rodricks?

11                  DR. RODRICKS: A. Well, again I would  
12                  limit it the way the MOE does; there is a suggestion or  
13                  limited evidence that phenoxy herbicides may be  
14                  associated with non-Hodgkin's lymphoma.

15                  Q. So you would agree with this  
16                  paragraph if it limited its ambit to non-Hodgkin's  
17                  lymphoma?

18                  A. Yes, and I would -- suggestion is a  
19                  little ambiguous in my mind and limited evidence, as  
20                  the MOE used it, is IARC terminology and that's very  
21                  widely used by epidemiologists. That seemed to me a  
22                  reasonable way to state it.

23                  I believe the Harvard Panel used the word  
24                  suggestive, I preferred what the MOE did. Maybe I'm  
25                  playing with words here, but I'm just noting that IARC

1 has some fairly clear definitions of what those terms  
2 mean and that's why I like them.

3 Q. And we're going to come to those  
4 terms and what they mean. I just wanted to clarify one  
5 thing you said. You said you preferred the terminology  
6 used by the Ministry of Enviornment; is that right?

7 A. In the expert panel.

8 Q. In the expert panel?

9 A. Yes.

10 Q. And as I believe I thought you  
11 indicated either yesterday or this morning, their  
12 terminology is essentially based on the IARC  
13 terminology; is that correct?

14 A. Yes. Yes, that's correct.

15 Q. All right, thank you. We will come  
16 to that. Now, I just wanted to follow up on one point  
17 that we were having a discussion about yesterday in  
18 conjunction with the Woods study. As I recall, I asked  
19 you -- actually that's Exhibit 1247. I don't think we  
20 particularly have to have it out at the moment, but if  
21 you want to have it at hand --

22 A. Let's see what the question is.

23 Q. There's a lot of paper, you might  
24 want to try and dig it out now. As I recall your  
25 answer to one of my questions, what I asked you was:

1 Did Woods gather data on frequency of use with any  
2 particular occupation. And as I recall your answer to  
3 that question was, no, they did not. Did I have that  
4 right?

5 A. I don't think that's quite right.  
6 They report two categories of exposure, one in Table 3  
7 of the report which listed which categorized exposure  
8 as low, medium or high, I assume based on all of the  
9 information they gathered about work history, and then  
10 in Table 4 they present relative risks by occupations,  
11 and within those occupations they do not -- they do not  
12 further subdivide exposures.

13 Q. Into frequency of use?

14 A. Yes, there's no indication in the  
15 table that they did that.

16 Q. All right. So I took that to mean  
17 that within those particular occupations they did not  
18 report on -- they did not gather it or, if they did,  
19 they didn't report--

20 A. They did not report, that's right.

21 Q. --on frequency of data?

22 A. Right.

23 Q. Excuse me, frequency of use.

24 A. That's how I read Table 4, yes.

25 Q. All right. Would it be fair to say



1           that if you don't have information on frequency of use  
2           your exposure data is less precise as a general  
3           principle?

4                     A. If you don't have it, sure; less  
5           precise than if you had it, yes -- less accurate, I  
6           should say.

7                     Q. All right. And we don't have it in  
8           Woods?

9                     A. Well, in their discussion of the data  
10          they gathered through interviews they asked about that  
11          and collected it, and I assume that's the basis for  
12          Table 3.

13                    Q. But they didn't report it?

14                    A. They didn't report how they then  
15          categorized exposures as low, medium and high, that is  
16          correct.

17                    Q. While we're on the subject of the  
18          Woods study, can you put Exhibit 1245 in front of you,  
19          that's the Harvard Report.

20                    A. Yes.

21                    Q. Page 34.

22                    A. 34?

23                    Q. 34, yes. We're looking at the top of  
24          the page. I'll just read from the part of the page  
25          that deals with this issue:

1 "A detailed personal interview was  
2 administered to obtain information on job  
3 titles and job activities which was used  
4 by the authors to assign subjects to four  
5 categories of exposure to phenoxy  
6 herbicides: high, medium, low or no  
7 exposure. The likelihood of exposure to  
8 pesticides based on the respondents'  
9 job titles or activities was the sole  
10 determinant in assigning them to an  
11 exposure category."

12 Is that your understanding as well, Dr.

13 Rodricks?

14 A. Yes, right.

15 Q. Thank you. Now, yesterday, Dr.

16 Rodricks, you and I were talking about the Kansas study  
17 and the Bond examination of the Kansas study, and  
18 perhaps for this discussion you should have in front of  
19 you Exhibit 754 which is the Kansas study and Exhibit  
20 715 which is the Bond paper - I shouldn't say the Bond  
21 paper it will probably sound like something else - the  
22 Bond article.

23 Now, as you recall -- or at least as I  
24 recall, Dr. Rodricks, I asked you where Bond had gotten  
25 an OR of 2.2 from the Kansas study and as I recall you

1 referred me -- first of all, let's do this  
2 sequentially. If we look at Exhibit 715, the Bond  
3 article, Table 1, page 174.

4 A. Yes.

5 Q. We see that in reporting odds ratio  
6 with respect to NHL from the Kansas study, the odds  
7 ratio is reported as 2.2 with a range of 1.2 to 4.1,  
8 and we see that range in the Kansas study reported at  
9 page 1143, and I'd like to direct your attention to  
10 page 1143 of the Kansas study, it's Exhibit 754.

11 A. Yes.

12 Q. And we're looking at Table 2 on that  
13 page and, Dr. Rodricks, can you confirm for me that the  
14 OR or the odds ratio of 2.2 is drawn from the herbicide  
15 group called 'ever used'?

16 A. Yes.

17 Q. So that if a farmer ever used 2,4-D  
18 he was placed into the exposure or exposed group --  
19 excuse me, exposed category group; is that right?

20 A. By the authors.

21 Q. By the authors of the Kansas study?

22 A. That's correct.

23 Q. And that is how we should read Table  
24 2 with respect to that particular matter?

25 A. Yes. Ever used, yes.

1 Q. And would you agree with me, Dr.  
2 Rodricks, that Bond in using the 2.2 odds ratio for the  
3 analysis he conducts in Exhibit 715 is masking the more  
4 precise exposure data available when frequency of use  
5 is considered as it is in Table 1 on page 1142 of the  
6 Kansas study?

7 A. There is -- you mean when they broke  
8 it down in terms of number of days per year?

9 Q. Yes, that's right.

10 A. Yes, that's correct.

11 Q. You agree with that comment?

12 A. Well, masking -- it's not included in  
13 his analysis, yes.

14 Q. Well, what's the effect of not  
15 including it in the analysis; isn't it masking the more  
16 precise exposure data available?

17 A. His analysis covers the overall  
18 findings for the entire population in all of the  
19 studies they put together, and that is the sort of  
20 analysis he conducted.

21 And so it is crude, as we said, it's just  
22 one way of looking at the overall outcome. It doesn't  
23 break it down into finer groups, and I think that is  
24 admitted. So that is surely a limitation.

25 Q. Would you agree with me that if you

1 break the data down to the more exposed occupational  
2 groups by frequency of use, the data becomes more  
3 precise and you see a significant odds ratio?

4 A. The odds ratio increases for those  
5 exposed I believe in this study more than--

6 Q. More than 20 days.

7 A. --20 days a year.

8 Q. So do you agree with my comment?

9 A. Well, it's a different way of looking  
10 at the data. More precise, do you mean more--

11 Q. More revealing.

12 A. You certainly need to look at that  
13 sort of information in making an overall weight of  
14 evidence evaluation, yes.

15 Q. You need to look at more precise data  
16 in order to make a better evaluation; is that right?

17 A. Yes, sure.

18 Q. Thank you. Now, while we're talking  
19 about the Bond article, it's -- do you have Exhibit  
20 1247 in front of you, it's the Woods study.

21 A. I think I do.

22 Q. I'm sure we can scare up a copy for  
23 you if you can't find it.

24 A. Yes, I have it.

25 Q. All right. Just keep that to one



1 side of your desk and let's return to Exhibit 715, the  
2 Bond article, Table 1 again on page 174. We're looking  
3 at Table 1 on page 174 of Exhibit 715.

4 A. Table 1. Yes, mm-hmm.

5 Q. Now, looking at that table Bond has  
6 the Woods study identified in that table. Would you  
7 agree with me that Bond reports the odds ratio for NHL  
8 in the Woods study as being 1.1?

9 A. Yes.

10 Q. And would you agree with me in  
11 looking at the exposure classification in Bond's table  
12 that this OR is drawn from the ever/never used specific  
13 phenoxies category?

14 A. Yes.

15 Q. And just referring you now to Exhibit  
16 1247, page 899. We're just looking at the abstract in  
17 this case. Woods states in the abstract, the sentence  
18 begins, "Among the study subjects...", it's about a  
19 quarter of the way down in the abstract.

20 A. In the abstract?

21 Q. Yes, I'm sorry, in the abstract, on  
22 page 899.

23 A. Yes.

24 Q. Woods states that:

25 "Among the study subjects with any past

1 occupational exposure to phenoxy  
2 herbicides the estimated relative risk  
3 and 95 percentage confidence interval of  
4 developing...", and we're just focussing  
5 here on NHL,

6 "...was 1.07, a range of 0.8 to 1.34..."

7 Which, Dr. Rodricks, would you agree with  
8 me is Bond's reporting of 1.1 in his exhibit?

9 A. Yes, he took that figure. Again, the  
10 overall outcome of the study. All of the studies he  
11 refers to look at subgroups within the larger group and  
12 some present higher risk numbers than shown here and  
13 some less within -- depending on how you cut up the  
14 different subgroups. So that Bond is clearly  
15 restricted only to the overall outcome from the  
16 studies.

17 Q. What we're doing is we're looking at  
18 how Bond cut up the pie?

19 A. That's right.

20 Q. I put it to you, Dr. Rodricks, that  
21 this is the same problem with the Bond analysis that we  
22 saw with his use of statistics in relation to the  
23 Kansas study.

24 If we look at amore precise exposure  
25 group in the Woods study, in this case take for example

1 forestry herbicide applicators, you get a more  
2 significant odds ratio of 4.8; isn't that right?

3 A. That is one other piece of the pie  
4 you could look at, yes. There are lots of others in  
5 here as well as we saw yesterday.

6 Q. Well, the pie that this Board is  
7 looking at is forestry and if we look at your - every  
8 so often I like to bring you back to your evidence - if  
9 we look at Exhibit 1239, your witness statement.

10 A. Yes.

11 Q. We're looking at page 61.

12 A. Yes.

13 Q. Sorry, we're looking at Figure 1  
14 which is your page 61, and just looking at the reported  
15 range and odds ratios for Woods, can you just confirm  
16 for me that what you reported on this page is Bond's  
17 OR -- I shouldn't say Bond's OR, but Bond's reporting  
18 of Woods' OR of 1.1?

19 A. Yes.

20 Q. Thank you. And not Woods' reporting  
21 of 4.8?

22 A. That's right.

23 Q. Thank you. And that's with respect  
24 to NHL; is that right?

25 A. That is correct.

1 Q. Would it be fair to say, Dr.  
2 Rodricks, that one of the reasons why Bond's reporting  
3 of OR is misleading in Exhibit 715 is because he uses  
4 the ORs from comparisons with the least precise  
5 exposure data in the manner that we have been  
6 discussing?

7 A. From all of the studies he deals  
8 with? I don't know whether I could generalize to all  
9 of the studies it summarizes.

10 Q. Well, let's just talk about the two  
11 we've been talking about, Woods and the Kansas study.

12 A. When you mean least, you mean most  
13 general category of exposure, yes, that is correct.  
14 There was any exposure in those studies, in those two  
15 studies.

16 Q. If I played golf once in my life, Dr.  
17 Rodricks, does that make me a golfer?

18 A. I wouldn't say so, no.

19 Q. So if I ever was exposed to an  
20 herbicide, does that put me in an occupational group of  
21 herbicide users?

22 A. Well, but it may or may not. If you  
23 just don't know, there is not much else one can do. I  
24 mean, this is common in epidemiology.

25 Q. That's fine.

1                   A. But let me just emphasize that the  
2                   Bond paper is one approach and he attempted to quantify  
3                   in some way a weight of evidence kind of judgment.  
4                   This is one approach to looking at the total related  
5                   evidence with respect to outcomes from many  
6                   epidemiology studies and I certainly wouldn't call this  
7                   a definitive analysis by any means, but it is one  
8                   analysis that has appeared in scientific literature.

9                   Q. I'm sorry, were you finished?

10                  A. It's one analysis that has appeared  
11                  in the scientific literature. I think the MOE analysis  
12                  is perhaps stronger because they do consider all of  
13                  these various subgroups that you mentioned.

14                  But it has -- I mean, the Bond study has  
15                  some weight I just -- and it has appeared in the  
16                  scientific literature.

17                  Q: I agree with you, Dr. Rodricks, that  
18                  Bond's analysis is one approach. What you and I are  
19                  discussing this morning is whether it's good thinking  
20                  or whether it's something less than good thinking.

21                  Dr. Rodricks, I wonder if I might direct  
22                  your attention to the MOE study, this is Exhibit 714.

23                  A. Yes.

24                  Q. We're looking at page 47.

25                  MADAM CHAIR: Which is that exhibit



1 number, Mr. Castrilli?

2 MR. CASTRILLI: Exhibit 714, Madam Chair.

3 MADAM CHAIR: Thank you.

4 MR. CASTRILLI: I don't know what your  
5 copy looks like, but my copy -- yes, that's it.

6 Q. I'm sorry, I believe I indicated  
7 we're looking at the bottom of page 47, Dr. Rodricks?

8 DR. RODRICKS: A. Yes.

9 Q. In the MOE study, Exhibit 714.

10 A. Yes.

11 Q. And in that last paragraph the MOE is  
12 discussing the Woods study and beginning with the --  
13 sorry, the third sentence in that paragraph, "There was  
14 no excess risk...", do you see that?

15 A. Yes.

16 Q. "There was no excess risk for past  
17 occupational exposure to phenoxy  
18 herbicides for either STS or NHL,  
19 however, there was an elevated risk of  
20 NHL among the following groups: men who  
21 had been farmer with a relative risk of  
22 1.33, forestry herbicide applicators,  
23 4.8; and those potentially exposed to  
24 phenoxy herbicides in any occupation for  
25 15 years or more during the period prior

1 to 15 years before cancer diagnosis  
2 1.17."

3 MR. FREIDIN: 1.71.

4 MR. CASTRILLI: I'm sorry, thank you,  
5 1.71.

6 Q. "Although these risks came from  
7 subgroup analyses, the subgroups were  
8 evaluated because of positive findings in  
9 other studies and because of knowledge on  
10 latent period effects in relation to  
11 carcinogenicity. The significant  
12 excesses are compatible with the  
13 expectations from other studies...",  
14 sorry, let me read that sentence again.

15 "The significant excesses are compatible  
16 with the expectations from other studies  
17 are, therefore important. An  
18 additional...", I'm sorry, I don't understand the  
19 sentence. There's either a word there that shouldn't  
20 be there -- all right, I think the gist of it is clear.

21 DR. RODRICKS: A. Maybe they mean, "and  
22 are therefore important."

23 Q. I think that's right.

24 "An additional confirmation was that  
25 increased risk of both STS and NHL was

1 observed among those individuals  
2 reporting prior occurrence of chloracne.  
3 This presumably indicates either those  
4 who had severe exposure or might have  
5 been unduly susceptible to the toxic  
6 effects of phenoxy herbicides."

7 Just stopping there, Dr. Rodricks, would  
8 you agree with me -- sorry. First of all, do you agree  
9 with the MOE's summary analysis of the Woods report as  
10 I just read it into the record?

11 A. Yes.

12 Q. And would you agree with me that MOE  
13 seems to take the view that it is important to look at  
14 subgroups?

15 A. Oh surely. I certainly agree with  
16 that.

17 Q. Thank you. Let's return to your  
18 evidence, Dr. Rodricks. This particular view comes up  
19 in a number of places. Let me just refer you initially  
20 to page (ix), paragraph 28 in I believe it's your  
21 executive summary. And in paragraph 28 you state:

22 "The available epidemiologic evidence  
23 does not support an association between  
24 phenoxy herbicides and NHL or STS."

25 And I believe at page 62 of your evidence

1 I think you basically restate the same proposition. So  
2 let me just take you to that page, about the middle --  
3 the middle paragraph--

4 A. Yes.

5 Q. --where you say:

6 "The conclusion of these authors...", and  
7 these authorities are the Bond study authors,

8 "...was that the weight of the evidence  
9 from the epidemiologic -- excuse me.

10 "...the human studies is not such that  
11 the phenoxy herbicides can be declared  
12 carcinogenic."

13 And I take it that's still -- I want to  
14 be clear about this. Is that your position now, Dr.  
15 Rodricks, or is that you reporting Bond's position?

16 A. My position is that I do not believe  
17 a causal relationship has been established in the IARC  
18 summary.

19 Q. Between...?

20 A. In the IARC sense of the term,  
21 between phenoxy herbicide exposure and any form of  
22 human cancer.

23 Q. Any form of human cancer?

24 A. That there is limited evidence in  
25 IARC terminology for an association for NHL.

1                   Q. Well, Dr. Rodricks, I think it's time  
2 we go to the IARC material. I believe I provided to  
3 you yesterday afternoon an excerpt from Supplement 7 of  
4 the IARC Monograph Series, 1987.

5                   Actually I provided you with two of them  
6 and I don't want to mislead you, they're from the same  
7 document, and my apologies if I did that. In an excess  
8 of zeal, for some reason I had too many staples and so  
9 I actually stapled the same document twice.

10                  The one I want to refer you to first is  
11 the smaller of the two dealing with phenoxy herbicides.  
12 I think it's apparent once you turn the first page  
13 which one it is.

14                  A. Let's see.

15                  Q. Actually, Dr. Rodricks, if you look  
16 at -- the first page in the excerpt that I want to  
17 refer you to after the title page is page 31.

18                  A. I'm sorry, are you looking at the one  
19 that's specific to phenoxy herbicides?

20                  Q. Yes. You have it.

21                  A. Okay.

22                  MR. CASTRILLI: Madam Chair, I'd ask that  
23 this be made the next exhibit.

24                  MADAM CHAIR: Exhibit 1252.

25                  MR. CASTRILLI: Madam Chair, the title --



1 well, actually the whole page is the title. I think it  
2 might simply be most easily referred to as IARC  
3 Monographs, Supplement 7, 1987, excerpts with respect  
4 to chlorophenoxy herbicides.

5 ---EXHIBIT NO. 1252: IARC Monographs, Supplement 7,  
6 1987, excerpts with respect to  
chlorophenoxy herbicides.

7 MR. CASTRILLI: Q. Dr. Rodricks, you've  
8 had an opportunity now to review this overnight?

9 DR. RODRICKS: A. Yes.

10 Q. And was it a document you were  
11 familiar with before you came to Toronto this week?

12 A. I have read it before, yes.

13 Q. Thank you. And just a point of  
14 clarification with respect to the IARC Monographs  
15 generally. Can you confirm for me that each of them is  
16 peer reviewed?

17 A. The IARC Monographs are peer  
18 reviewed, yes.

19 Q. Thank you. Excuse me, Dr. Rachman.  
20 Dr. Rachman, if you're going to say something to the  
21 witness while he's under cross-examination, I would  
22 like to hear it on the record or else I would ask that  
23 you not do it.

24 DR. RACHMAN: A. All right. Mr.  
25 Castrilli, I'll be happy to repeat what I just told Dr.

1 Rodricks.

2 Q. I'm simply suggesting that in future  
3 you not communicate with the witness unless you're  
4 going to communicate it on the record.

5 A. All right.

6 Q. Now, Dr. Rodricks, just begin with a  
7 general proposition with respect to this document.

8 As I understand the position that IARC  
9 has taken with respect to the chlorophenoxy herbicides  
10 is that they have concluded that as a class of  
11 chemicals - and I mean that now all of them as opposed  
12 to any single one of them - that the class of  
13 chlorophenoxy herbicides are possibly carcinogenic to  
14 humans; is that right?

15 DR. RODRICKS: A. I don't think they say  
16 that, except -- I don't remember their saying that  
17 exactly. We have to apply their criteria.

18 Q. Well, that's what we're going to do.

19 A. Okay. Their criteria for possibly  
20 carcinogenic. This category is generally used - I'm  
21 reading from page 32, what they call group 2B:

22 "This category is generally used for  
23 agents for which there is limited  
24 evidence in humans in the absence of  
25 sufficient evidence in experimental

1 animals."

2 And as they label the evidence for  
3 carcinogenicity in humans limited on page 156, and 158  
4 inadequate for animals. So I assume they mean it's a  
5 group 2B, possibly human carcinogenicity.

6 Q. All right. Let's take this  
7 sequentially. Let's turn to page 32 -- I'm sorry,  
8 let's first turn to page 156.

9 A. Yes.

10 Q. You'll see that the heading for  
11 chlorophenoxy herbicides has in brackets after it  
12 (group 2B).

13 A. Yes.

14 Q. And the definition of group 2B is as  
15 you indicated on page 32. At the top of the page we  
16 see the definition:

17 "Group 2B, the agent is possibly  
18 carcinogenic to humans."

19 And in this case they mean the class of  
20 chlorophenoxy herbicides as opposed to any one member  
21 chemical within that group is my understanding. Is  
22 that your understanding?

23 A. Yes.

24 Q. Now, let's just read together the  
25 complete definition of group 2B.

1 "This category is generally used for  
2 agents for which there is limited  
3 evidence in humans in the absence of  
4 sufficient evidence in experimental  
5 animals. It may also be used when there  
6 is inadequate evidence of carcinogenicity  
7 in humans or when human data are  
8 non-existent, but there is sufficient  
9 evidence of carcinogenicity in  
10 experimental animals. In some instances  
11 an agent for which there is inadequate  
12 evidence or no data in humans but limited  
13 evidence of carcinogenicity in  
14 experimental animals together with  
15 supporting evidence from other relevant  
16 data may be placed in this group."

17 I hope I didn't mangle the last part of  
18 that sentence, but I think it's clear from the text of  
19 the page. Is that, Dr. Rodricks, your understanding of  
20 the classification system, at least with respect to 2B?

21 A. They still adhere to that, those  
22 criteria.

23 Q. Thank you. Now, let me refer you to  
24 page 156 of Exhibit 1252, and we've indicated already  
25 that the chlorophenoxy herbicides as a group or

1 collectivity of chemicals has been identified by IARC  
2 as a group 2B. So that -- I think you've already  
3 confirmed this, but let me just get it clear again on  
4 the record.

5 IARC has concluded that the chlorophenoxy  
6 herbicides as a class of chemicals should be regarded  
7 as possibly carcinogenic to humans because they have  
8 placed it in group 2B; is that your understanding?

9 A. Yes.

10 Q. Now, I would like to refer you to  
11 page 157. Sorry, and what 157 is, this is the first  
12 portion of their discussion of the data available, in  
13 this particular case they're talking about the human  
14 data; is that right?

15 A. Yes.

16 Q. Looking at the first full paragraph  
17 on that page they're discussing now the Swedish studies  
18 and they state the following:

19 "Two population-based case control  
20 studies conducted in northern and  
21 southern Sweden respectively show a  
22 statistically significant association  
23 between exposure to chlorophenoxy  
24 herbicides especially in forestry and  
25 agriculture and the occurrence of soft



1 tissue sarcomas."

2 And then the remainder of the paragraph,  
3 would you agree with me, Dr. Rodricks, goes on to  
4 discuss further studies and doesn't further discuss the  
5 Swedish studies, at least in that paragraph?

6 A. No, that is the only reference to the  
7 Swedish studies there, yes.

8 Q. All right, thank you. And then in  
9 the next paragraph beginning with the second sentence  
10 they are now discussing the Kansas studies, and they  
11 state:

12 "The population-based case control study  
13 of soft tissue sarcoma and Hodgkin's and  
14 non-Hodgkin's lymphoma in Kansas showed  
15 that use of 2,4-D was associated with  
16 non-Hodgkin's lymphoma especially among  
17 farmers who had been exposed for more  
18 than 20 days per year among whom there  
19 was an approximately six-fold excess and  
20 among those who had mixed or applied the  
21 herbicides themselves. Hodgkin's  
22 lymphoma was not, however, found to be  
23 associated with herbicide exposure."

24 I believe that's also a reference to the  
25 Kansas study - yes, it is - and then the remainder of

1 the paragraph does not deal further with the Kansas  
2 study.

3 And then in the last paragraph -- sorry,  
4 excuse me, the last few sentences on that page --  
5 sorry, in that paragraph IARC is now discussing the  
6 Woods study, and they state:

7 "Farmers and forestry workers in  
8 Washington State USA with exposure to  
9 phenoxy herbicides had a significantly  
10 increased risk of non-Hodgkin's lymphoma.  
11 People of Scandinavian descent in the  
12 area had an increased risk of soft tissue  
13 sarcoma in connection with phenoxy  
14 herbicide exposure but no increased risk  
15 of non-Hodgkin's lymphoma."

16 So that is an interesting statistic for  
17 those of us who are Scandinavian.

18 MR. CASSIDY: You're Scandinavian?

19 MR. CASTRILLI: No. For those of you who  
20 are Scandinavian.

21 Q. There are no qualifications in the  
22 discussions of those three studies; would you agree  
23 with me, Dr. Rodricks?

24 DR. RODRICKS: A. They're just very,  
25 very broad conclusions of all of them.

1 Q. Now, in your evidence at pages 60 and  
2 62 -- sorry, simply with respect to the Swedish  
3 studies, I think in both cases you're referring to the  
4 Bond discussion of the Swedish studies. You state  
5 that:

6 "Serious methodological questions have  
7 been raised about the Swedish studies and  
8 that there...", let me get this accurate.

9 MADAM CHAIR: Excuse me, Mr. Castrilli,  
10 are we on page 62 of Exhibit 1239?

11 MR. CASTRILLI: I'm sorry, it appears two  
12 places in the evidence and perhaps the easiest way to  
13 do is this is first refer Dr. Rodricks to page 60.

14 MADAM CHAIR: 60, six zero?

15 MR. CASTRILLI: Six zero, I'm sorry.

16 Q. The first full paragraph on the page,  
17 Dr. Rodricks, the last sentence:

18 "Bond et al. also concluded that there  
19 were serious methodologic questions about  
20 the Swedish studies."

21 And then I believe at page 62 of your  
22 evidence at the top of the page you state -- actually  
23 it begins at the bottom of page 60 and it goes on to  
24 page 62:

25 "Of the two positive studies, the

1 methodology of the Hardell study, 1981 is  
2 open to question."

3 Now, I'm not clear there. Is that your  
4 assessment, Dr. Rodricks, or is that you reporting on  
5 Bond's assessment of the Swedish studies?

6 A. That's Bond's assessment and those on  
7 several other papers in the literature that Bond cites  
8 in his article.

9 Q. Is it a view you hold, that the  
10 methodology of the Hardell studies is open to question?

11 A. There is some question about recall  
12 bias in the studies because of the way they went about  
13 collecting that information. I don't have any  
14 compelling reason to discount the study though for  
15 that -- for methodological reasons, I only note that  
16 those questions have been raised.

17 Q. All right.

18 A. The MOE also discusses that at quite  
19 some length.

20 Q. It's not discussed in IARC; is that  
21 right?

22 A. No, these are all just very, very  
23 broad summary statements. The summary written here is  
24 not a critical review at all, it is just -- the IARC  
25 summary is just a summary of some observations.

1 Q. Well, Dr. Rodricks -- sorry.

2 A. They don't write long critical  
3 reviews of all of this. There may be some background  
4 documents they use as the basis for this, but this is  
5 not -- this is just a set of conclusions from each of  
6 the studies.

7 Q. Dr. Rodricks, does the working group  
8 of IARC cavalierly make an assessment about a chemical?

9 A. I hope not. I am sure they do not.

10 Q. Thank you.

11 A. I'm saying the discussion here on the  
12 page is just a summary discussion.

13 Q. Now, at page 53 of your evidence --  
14 sorry, we are looking at the first full -- I'm sorry,  
15 the second full paragraph on that page. You state that  
16 the Kansas study is subject to several uncertainties  
17 and we discussed some of those yesterday, we don't need  
18 to repeat them, and finally at page 60 of your  
19 evidence, down at the bottom of the page you state  
20 that:

21 "Among other studies, the Woods study is  
22 negative."

23 A. We went over that yesterday.

24 Q. And we went over that yesterday and  
25 we don't need to go over that again, I think we've had



1 your clarification on the record with respect to that.

2 I just put the proposition to you, Dr.  
3 Rodricks, that if two of these studies are open to  
4 question or uncertainty, the third as at least  
5 expressed in your written evidence - now as qualified  
6 as your oral evidence - was negative, then would you  
7 agree with me that either there must be other clearly  
8 positive studies out there or else these studies that I  
9 just referred you to; the Swedish studies, the Kansas  
10 study and the Woods study, are being given greater  
11 weight internationally than you were prepared to give  
12 in your evidence?

13 A. We were asked to look more  
14 specifically at the Kansas study. We don't have --  
15 this is not -- our evidence is not a thorough  
16 evaluation of all of the literature on phenoxy  
17 herbicides epidemiology, and I don't think we've set it  
18 forth as that. We were not asked to conduct such a  
19 review.

20 There is some observations on the studies  
21 in the United States, the more recent Kansas study,  
22 observations on the Nebraskas study and the Woods  
23 study, but this is by no means - I hope it doesn't  
24 appear to be - a thorough review of the epidemiology  
25 work, our evidence that is. The MOE conducted such a

1 review, as did the Harvard Panel.

2 MADAM CHAIR: Excuse me, Dr. Rodricks.  
3 Do you agree with the implication that Mr. Castrilli is  
4 putting on the difference between your review of the  
5 studies you looked at and what the IARC had to say?

6 DR. RODRICKS: Maybe I missed the  
7 implication.

8 MADAM CHAIR: Maybe I got it wrong, Mr.  
9 Castrilli, but I thought you were saying that the IARC  
10 gives greater weight to the Swedish, Kansas and Woods  
11 studies and their results than does Dr. Rodricks in his  
12 review?

13 MR. CASTRILLI: Madam Chair, even without  
14 referring to any of the other studies on pages 156 and  
15 157 of Exhibit 1252, the working group of IARC was  
16 prepared to identify the chlorophenoxy herbicides as a  
17 class as possibly carcinogenic to humans.

18 And what we have in Dr. Rodricks'  
19 evidence, for example when we look at Figure 1 and Dr.  
20 Rodricks' reliance on the Bond study, and also the  
21 statements I read into the record about what Bond had  
22 to say about the chlorophenoxy herbicides as a class,  
23 is that they weren't prepared to make -- they don't  
24 make that conclusion and it's in Dr. Rodricks' paper,  
25 so I don't know what to make of Dr. Rodricks' position.

1                   MADAM CHAIR: So, Dr. Rodricks', are you  
2                   disputing the group 2B classification of IARC?

3                   DR. RODRICKS: No. Let me -- I guess I  
4                   need to clarify this. We did not conduct a thorough  
5                   independent review of all the epidemiology data. Our  
6                   initial charge was to examine what the MOE did and  
7                   after the evidence statement was prepared the Harvard  
8                   Panel report came out, so we were also asked to look at  
9                   it and to make an evaluation of the general quality of  
10                  that review.

11                  Some issues regarding the Kansas study  
12                  and the Nebraska Study in particular had come up in Dr.  
13                  Ritter's testimony and so we were asked to make further  
14                  commentary on those particular studies. The Bond study  
15                  is something that appeared in the literature as one  
16                  evaluation, one type of evaluation of the overall  
17                  evidence.

18                  I think we said we basically agree with  
19                  what the MOE Panel report does and I wouldn't disagree  
20                  with the IARC classification as 2B, and I hope that's  
21                  clear.

22                  MR. CASTRILLI: That's fine.

23                  MADAM CHAIR: Thank you.

24                  DR. RODRICKS: Of a class of  
25                  chlorophenoxies.

1 MR. CASTRILLI: Yes. And, Madam Chair, I  
2 don't wish to be seen to be muddying the waters on  
3 this. My emphasis has been on the chlorophenoxy  
4 herbicides as a class with respect to this discussion.  
5 I think it's clear if you go on to further pages of  
6 Exhibit 1252 that IARC indicates that the animal  
7 evidence with respect to - and they there break down  
8 the chemicals by type 2,4-D and 2,4,5-T. At the time  
9 that this was written in 1987 IARC indicates that the  
10 animal evidence is inadequate to classify 2,4-D and  
11 2,4,5-T.

12 DR. RODRICKS: I need to add to this that  
13 the IARC did not have available, in fact would not have  
14 reviewed the industry study you've mentioned that has  
15 been submitted to EPA because it's not a published  
16 study, they restrict their reviews entirely to  
17 published literature.

18 That study appeared I guess at about the  
19 same time as this review and does not discuss this  
20 review. Obviously I cannot judge whether IARC, if they  
21 had that study, would review it and whether or not they  
22 would consider it.

23 MR. CASTRILLI: Q. I'm sorry, when you  
24 say -- which study is this you're referring to?

25 DR. RODRICKS: A. I'm talking about the

1 industry task force study that is extensively discussed  
2 in the MOE, the long-term animal cancer study in mice  
3 and rats on 2,4-D that we've talked about earlier today  
4 where we had the discussion about EPA believing an MTD  
5 had not been reached.

6 Q. That's right. All right, I'm fine, I  
7 understand.

8 A. That study is not discussed here, and  
9 I'm simply saying if the IARC committee would review  
10 that study - they haven't - I cannot judge whether they  
11 would consider it now adequate to judge  
12 carcinogenicity, and if they did they would find it  
13 insufficient I'm sure to categorize it as a carcinogen,  
14 but how they would come out on the MTD issue I  
15 certainly don't know.

16 Q. And also IARC of course did not have  
17 the Canadian mortality study to evaluate either; did  
18 it?

19 A. No, they would not have had that.

20 Q. And nor would MOE?

21 A. That's correct.

22 Q. And nor would Harvard; is that right?

23 A. That's correct.

24 Q. They don't refer to it?

25 A. That's right.



1 MR. CASTRILLI: Madam Chair, I'm  
2 wondering if you might indulge me in a two minute  
3 earlier break than normal because the next section of  
4 my cross-examination is fairly extensive and I don't  
5 want break it up, if I can avoid it.

6 MADAM CHAIR: That's fine, Mr. Castrilli.

7 MR. CASTRILLI: Thank you.

8 MADAM CHAIR: Thank you. We will be back  
9 in 20 minutes.

10 ---Recess taken at 10:08 a.m.

11 ---On resuming at 10:40 a.m.

12 MADAM CHAIR: Please be seated.

13 Before Mr. Castrilli begins, I will just  
14 tell the parties that the Board has put together a  
15 tentative schedule for the Panel 10 evidence and Ms.  
16 Devaul is just preferring that now and we'll hand it  
17 out to you before lunch, so you might all take a look  
18 at it and if you have any comments, when we come back  
19 tonight to talk about the witness business.

20 And I don't know why, it was just  
21 particularly hard to get this schedule organized, and  
22 there are a few things I think Ms. Devaul is explaining  
23 in the schedule about it, but essentially we couldn't  
24 work with the first week of July or the second week of  
25 August because two full-time parties were unable to be

1 here then and we thought it would run into their  
2 cross-examination time, and also we have been having  
3 long discussions with the parties at Red Lake and  
4 apparently their preference is that Red Lake be  
5 deferred rather than go ahead on the dates we had  
6 suggested in August.

7 So those are some of the reasoning that  
8 went into that. My understanding is Ms. Devaul was in  
9 touch with the MNR people because notice has been  
10 prepared for Red Lake, but it has not been issued. So  
11 all the work that has gone into that can easily be  
12 deferred, it will all be used eventually anyway.

13 MR. HUFF: Deferred. Deferred for a  
14 week, a month?

15 MADAM CHAIR: No, no, I would expect it  
16 would be after your case.

17 MR. MARTEL: Don't panic.

18 MR. HUFF: I was just wondering what  
19 deferred meant.

20 MADAM CHAIR: No, we're trying to  
21 separate all these locations.

22 Mr. Castrilli?

23 MR. CASTRILLI: Thank you, Madam Chair.

24 Q. Dr. Rodricks, yesterday we were  
25 talking about the Canadian mortality study. I wonder

1 if you could grab from your increasingly formidable  
2 pile of papers on your desk the following exhibits;  
3 Exhibit 717 --

4 DR. RACHMAN: A. The abstract?

5 Q. The abstract, Exhibit 1244, which is  
6 the mortality study itself, and Exhibit 1248 which is  
7 Aaron Blair's comment on the mortality study.

8 Just very quickly with respect to the  
9 issue of whether Exhibit 717, paragraph 1, which was  
10 the abstract filed in August of 1989 before this Board,  
11 is still reflected in Exhibit 1244. Were you able to  
12 determine that over the evening, Dr. Rodricks, one way  
13 or the other?

14 DR. RODRICKS: A. The first paragraph of  
15 the abstract does not appear in the full report of the  
16 study.

17 Q. All right, thank you. Now, I'd like  
18 to refer you to the commentary on the Canadian study  
19 prepared by Aaron Blair which now, as I recall, was  
20 yesterday made Exhibit 1248. As a means to shortening  
21 up the discussion on the Canadian study itself, first  
22 of all, Aaraon Blair is one of the co-authors of the  
23 Kansas study; is that right?

24 A. That's right.

25 Q. And do you know Dr. Blair? He's a

1 doctor; is that right?

2 A. Yes, he is. I don't know him though.

3 Q. Do you know him by reputation?

4 A. By reputation, yes.

5 Q. And do you know him by reputation to  
6 be an expert in the area of epidemiology?

7 A. Occupational epidemiology, yes.

8 Q. Now, Dr. Blair draws several  
9 conclusions from the - I think I'll call it the Wigle  
10 study if I might just for easy identification - Dr.  
11 Blair draws several conclusions from the Wigle study  
12 and I would like to put a number of them to you and get  
13 your assessment of them.

14 First of all, I would like to refer you  
15 to page 544 of Exhibit 1248, it's the first page of the  
16 Blair critique and we're looking at column -- the  
17 left-hand column, column 1, the last full paragraph,  
18 the paragraph that begins, "This investigation..."

19 And I'm particularly interested in the  
20 first proposition that Dr. Blair outlines, and I'll  
21 just read that into the record and I'd like your  
22 comment on it.

23 "First, the association between the use  
24 of herbicides..."

25 I'm not sure what it is I'm competing

1 with this morning, is it an ambulance?

2 MR. CASSIDY: A thief.

3 MR. CASTRILLI: A thief. All right.

4 Q. Let me start again:

5 "First, the association between the use

6 of herbicides and the risk of

7 non-Hodgkin's lymphoma among farmers seen

8 in this cohort study despite reliance on

9 relatively crude census and mortality .

10 data is consistent with findings from

11 most...", and Dr. Blair refers to

12 references 3 through 7; 3 is the Swedish studies, 4 is

13 the Kansas study, 5 is the Woods study and 6 and 7 are

14 two studies we've not otherwise been discussing, and

15 then he says:

16 "...but not all...", and not all is a

17 reference to Pierce study in reference No. 8:

18 "...case control studies designed to

19 investigate this issue."

20 In general, Dr. Rodricks, do you agree

21 with Dr. Blair's first comment?

22 DR. RODRICKS: A. That's generally

23 right. There's a question about whether it really is

24 consistent with the Woods study for things we talked

25 about yesterday, inconsistent with finding in the



1 occupational -- some of the findings in the  
2 occupational categories, but not the overall finding.  
3 But otherwise I agree with this.

4 Q. All right, thank you. Let me next  
5 refer you to the bottom of that left-hand column the  
6 paragraph that begins, "second"; do you see that?  
7 "second mortality from non-Hodgkin's."

8 A. Yes.

9 Q. Let me just read that into the record.  
10 "Second, mortality from non-Hodgkin's  
11 lymphoma rose significantly with  
12 increasing number of acres sprayed with  
13 Herbicides particularly on smaller  
14 farms where the farmer is more likely to  
15 have personally engaged in herbicide  
16 application. This exposure response  
17 gradient persisted despite study  
18 limitations and exposure assessment that  
19 would tend to mute any exposure response  
20 effect. For example, acres sprayed is  
21 only a surrogate measure for delivered  
22 dose, a farmer's use of herbicide in  
23 1970 may not be representative of use in  
24 other years and a large proportion of  
25 subjects are likely to have ceased

1 farming since 1970."

2 In general, Dr. Rodricks, do you agree  
3 with that assessment?

4 A. Well, some of it and some not because  
5 it's a little misleading. He says in the first  
6 sentence, where he says that there was -- mortality  
7 from non-Hodgkin's lymphoma rose significantly with  
8 increasing number of acres sprayed with herbicides  
9 particularly on smaller farms.

10 The evidence in the Wigle study is only  
11 on smaller farms, not particularly -- actually the  
12 evidence went -- the direction of the effect went the  
13 other way toward no effect and decreasing effects on  
14 larger farms. So particularly on smaller farms is a  
15 little misleading.

16 Q. I thought what the Wigle study did  
17 was it broke down the analysis between those who farmed  
18 on less than a thousand acres and those who farmed on  
19 more than thousand acres?

20 A. Right.

21 Q. And where the statistically  
22 significant findings were made were with respect to  
23 farmers farming on less than a thousand acres; isn't  
24 that right?

25 A. You asked me about Dr. Blair's

1           characterization. He says particularly on smaller  
2           farms, which implies it might have also increased on  
3           larger ones, when in fact I think the appropriate word  
4           is only on smaller farms. That's what I'm saying.

5                       Q. All right.

6                       A. There's also -- may I check something  
7           on the second part of that sentence.

8                       Q. Yes, please.

9                       A. I need to check my memory. Sorry,  
10          give me just a couple of minutes. I'm trying to check  
11          whether -- I thought they had a comment about whether  
12          or not they had any evidence on the issue of whether  
13          farmers are more likely to engage in herbicide  
14          application on smaller farms, and I know I saw a  
15          reference to that in here, but I can't --

16                      MADAM CHAIR: Blair makes reference to  
17          that, but you're looking for it in...?

18                      DR. RODRICKS: I'm looking for it in the  
19          Wigle report.

20                      MR. CASTRILLI: Q. Well, actually we're  
21          going to come to that, so if you find you can't find  
22          it, perhaps we'll run into it shortly.

23                      DR. RODRICKS: A. Okay. Let's hold that  
24          question.

25                      Q. Okay.

1                   A. I'm trying to remember whether they  
2                   were able to determine whether in fact that was true.  
3                   And the rest of the paragraph comes from the Wigle  
4                   report, that was also their opinion of the possible  
5                   study limitations with respect to exposures.

6                   Q. Well, while we're dwelling on the  
7                   issue of particularly on smaller farms where the farmer  
8                   is more likely to have personally engaged in herbicide  
9                   application, which I guess is what you were looking for  
10                  in the text.

11                  A. I was looking for it in the text.

12                  Q. I want to refer you to page 63 of  
13                  your evidence.

14                  A. 63 of our evidence?

15                  Q. Of your evidence, Exhibit 1239.

16                  A. Dr. Ritter's comment?

17                  Q. Yes. The last paragraph on page 63.

18                  Now, Ritter stated that the analysis of the  
19                  farm-operated data suggested at this preliminary stage  
20                  that farmers with fewer acres (under one thousand for  
21                  example) were more likely to contract out spraying  
22                  operations. Let me just read that whole paragraph  
23                  actually:

24                  "This would be mean that the farmers  
25                  would be increased, NHL risk would not

1 have had the same opportunities for  
2 herbicide exposures as would the farmers  
3 with larger operations and no excess risk  
4 of NHL. If this is correct...", and I  
5 gather now this is your comment,

6 "...and no other link associating  
7 herbicide use with NHL is identified,  
8 then the combination of the lack of  
9 elevated risk of NHL among farmers and  
10 the manifestation of increased risk in  
11 the subset of the population with less  
12 chance for herbicide exposure will argue  
13 strongly against the presence of an  
14 association between herbicide use and  
15 NHL."

16 Now, I take it that was Ritter's  
17 statement at the time -- sorry, I know it was Ritter's  
18 statement at the time, I was there, and it's also  
19 reflected in the transcript at that page and I think  
20 what you've done there is simply summarize the  
21 transcript, if I'm not mistaken.

22 A. That's correct.

23 Q. The point that I want to draw to your  
24 attention, Dr. Rodricks, is page 580 of the Wigle  
25 study.



1 A. Yes.

2 Q. Sorry, we're looking at column --  
3 I'll call it column 2, the first full paragraph in  
4 column 2.

5 A. This is the one I was looking for.

6 Q. Just let me read that into the  
7 record:

8 "The differential effect of herbicide  
9 spraying according to farm size raises  
10 several questions relating to farming  
11 practices. The RR...", that is the  
12 relative risk,  
13 "...of non-Hodgkin's lymphoma as a  
14 function of farm size declined sharply  
15 for farms larger than one thousand acres,  
16 although on farms smaller than one  
17 thousand acres there was a significant  
18 increase in risk for non-Hodgkin's  
19 lymphoma when expressed as a function of  
20 acres sprayed for weeds. The causal  
21 significance of these observations cannot  
22 be fully assessed due to the posity of  
23 data on the use of hired applicators to  
24 carry out weed spraying operations.  
25 Moreover, on large farms an appreciable

1 proportion of pesticides might be applied  
2 by aircraft."

3 Now, would you agree with me, Dr.

4 Rodricks, that Wigle et al. -- and the et al. in this  
5 case includes Ritter - do not in the final write-up of  
6 this study which is now Exhibit 1244, repeat the  
7 comment that Ritter made before this Board, that at a  
8 preliminary stage the data suggested that farmers with  
9 fewer acres were more likely to contract out their  
10 spraying operations?

11 A. Yes, this says we don't know.

12 Q. Exactly.

13 A. And that's why I questioned Blair's  
14 conclusion too, I'm not sure how he knows because he  
15 implies here some knowledge of that. That is why I was  
16 looking for it in connection with the statement you  
17 asked me to --

18 Q. Well, as I recall, and perhaps this  
19 would be the appropriate time to refer to the  
20 transcript, that's Volume 122.

21 All right. Somewhere, I don't actually  
22 have the full transcript here, I'm looking at a  
23 condensation of it, but it's somewhere between pages  
24 20468 and 20473.

25 A. Well, I think our evidence has the

1 citation.

2 Q. Yes, you refer to the right pages.  
3 What is not referred to I think -- I think is not  
4 referred to in your summary is that the proposition  
5 that Ritter at the time was purporting to discount was  
6 was the generally held view that - as he described it -  
7 some observers have proposed that the breakdown in  
8 the --

9 A. Where are you reading from, I'm  
10 sorry?

11 Q. Well, I don't have the transcript.  
12 Could I borrow your copy of the transcript?

13 MR. CASSIDY: They're still in the  
14 library if you need it. What was that, Mr. Martel?

15 MR. MARTEL: I won't comment.

16 MR. CASTRILLI: As I say, I'm reading --

17 MADAM CHAIR: Is that 20472, Mr.  
18 Castrilli?

19 MR. CASTRILLI: Yes.

20 Q. All right. What Ritter said at the  
21 bottom of page 20471 and the top of 20472 was --  
22 actually let me go back one further paragraph,  
23 beginning line 19 on page 20471, this is Ritter  
24 speaking:

25 "Now, we felt what made that second

1 observation even more interesting than  
2 the first was that in the first case  
3 when we looked at acres sprayed for  
4 weeds the relationship fell apart beyond  
5 a thousand acres and we don't have a  
6 ready explanation for that. In the first  
7 instance it's tempting to speculate that  
8 that may be the case because on farms  
9 larger than a thousand acres one might  
10 imagine that the spraying operation would  
11 be contracted out and, consequently, the  
12 individual farmer would no longer be  
13 taking the risk and so the risk  
14 relationship might fall apart on farms  
15 larger than a thousand acres.

16 On reflection we find that that may  
17 not be correct, it may actually be the  
18 converse. The information which we are  
19 gathering suggests at least in its  
20 preliminary phase that it may well be the  
21 smaller farms in which the spray  
22 operation is contracted out because  
23 farmers with only a few hundred acres may  
24 not be prepared to make the investment in  
25 the spray rig necessary to spray their

1 own fields and the larger farms may be  
2 spraying their own fields. So if that's  
3 true, I would have no biologically  
4 plausible explanation for that  
5 observation in spite of the fact that the  
6 observation stands."

7 Now, that's I think essentially -- the  
8 latter part is essentially what you summarized in your  
9 evidence, and the first portion of that was simply the  
10 other -- what I took to be the other proposition that  
11 on larger farms you contract out. And, in any event --

12 DR. RODRICKS: A. No, I'm sorry --

13 Q. Well, that is what I take Blair to be  
14 saying.

15 A. Blair seems to say that. I don't  
16 know where he got that information.

17 Q. Well, he probably didn't get it from  
18 that transcript, but Ritter also puts that speculation  
19 forward and Ritter discounts it on the basis of what he  
20 describes.

21 A. No, no, no. Blair says,  
22 "Particularly on smaller farms where the  
23 farmer is more likely to have personally  
24 engaged..."

25 Q. That's right, he's assuming that --



1 A. That's what Blair says.

2 Q. That's right.

3 A. And Ritter says the preliminary  
4 information is the other way around.

5 Q. Right. But I'm putting the  
6 proposition --

7 A. The report itself says we don't know  
8 for sure. It would be interesting to ask Dr. Ritter  
9 now what this preliminary information was perhaps in  
10 more detail, but the actual published paper says there  
11 was not much information on this topic.

12 Q. It was certainly brought to Dr.  
13 Ritter's in August of '89, seven or eight months before  
14 this was published and even if the preliminary  
15 investigations showed that, in the final report the  
16 authors don't draw the conclusion that Ritter put  
17 before this Board; isn't that right?

18 A. That conclusion is not in the final  
19 report, that is correct.

20 Q. Thank you.

21 A. He must have had some basis for this  
22 statement. I don't know what it was obviously, that  
23 is, Dr. Ritter.

24 Q. Well, some basis however, but not  
25 enough to find its way into the final paper.

1 A. That's right.

2 Q. Now, what Wigle did say was that on  
3 large farms (i.e., over a thousand acres) an  
4 appreciable proportion of pesticides might be applied  
5 by aircraft.

6 That seems to me to be a proposition as  
7 to why the risk relationship breaks down over a  
8 thousand acres, farmers are no longer the ones spraying  
9 over a thousand acres. Isn't that a reasonable way to  
10 interpret that last statement, Dr. Rodricks?

11 A. If that's true. That sentence seems  
12 to be just a guess. The previous sentence says they  
13 had a posity of data on the use of hired applicators.  
14 That seemed to be the factual information they had.

15 Q. Let's just speculate for a moment,  
16 since everyone else seemed to have speculated on this  
17 issue. On a larger farm if there was aircraft  
18 spraying, which would be the contracting out situation,  
19 that could account; would you agree, for the decline in  
20 NHL on large farms over a thousand acres?

21 A. If that meant the farm operator had  
22 less exposure in a set of circumstances, then it might  
23 account for the observation, yes.

24 Q. All right, thank you. And we don't  
25 have any better information one way or the other?

1 A. The authors of the report do not.

2 Q. And we certainly don't have any  
3 better information -- and we certainly don't have any  
4 information to confirm Ritter's comment in the  
5 transcript from Volume 122; do we?

6 A. Not in this published report.

7 Q. All right, thank you. Let's move  
8 right along to -- sorry, go back on Exhibit 1248 now,  
9 the Blair commentary. We're now looking at the first  
10 full paragraph in column 2, the one that begins,  
11 "Third..."

12 A. May I make one more comment?

13 Q. Yes, please do.

14 A. I'm sorry. We were on the first full  
15 of --

16 Q. I'm sorry, we were on --

17 A. The first full of the second column?

18 Q. We're now going to the first full.

19 A. You are.

20 Q. The one that begins, "Third..."

21 A. Okay, go ahead.

22 Q. Okay. Sorry. Was there a comment  
23 you wanted to make, or can I continue?

24 A. No.

25 Q. All right. That paragraph reads:

1 "Third, the exposure information  
2 available in this cohort, although less  
3 than that available in case control  
4 studies, would be less affected by  
5 accuracy of respondent recall, a major  
6 criticism of case control studies. In  
7 the cohort study presented here the  
8 information on herbicide use in 1970 is  
9 probably reasonably accurate, but it is  
10 unclear how well herbicide use during  
11 this year represents farmer's use of  
12 other years. The results from the cohort  
13 study are also unlikely to be due to case  
14 response bias, an issue often raised in  
15 regard to case control studies. When  
16 based on analysis of deaths that occurred  
17 after 1981, the association between use  
18 of herbicides and risk of non-Hodgkin's  
19 lymphoma among farmers persisted for  
20 years after the termination of exposure  
21 in 1970."

22 I presume he means there the end of  
23 exposure in 1970.

24 "This minimizes the possibility that the  
25 results are due to response bias among

1 Non-Hodgkin's lymphoma cases."

2 Now, just stopping there, Dr. Blair, do  
3 you agree with that assessment?

4 A. If I'm Dr. Blair I certainly would.

5 Q. I'm sorry. Well, at least I haven't  
6 withdrawn your Ph.D. as I did with Dr. MacCormack.

7 MR. CASSIDY: Turn your name tag around.

8 MR. CASTRILLI: That might actually help.  
9 Actually, it probably won't help.

10 Q. Dr. Rodricks, do you agree with that  
11 assessment of Dr. Blair's?

12 DR. RODRICKS: A. I do.

13 Q. Thank you.

14 A. All the information they had on  
15 exposure was collected long before the disease outcome  
16 was studied.

17 Q. Continue with this page of Dr.  
18 Blair's commentary, and we're now looking at the  
19 paragraph just below the one I just read into the  
20 record, the one that begins, "Finally..."

21 "Finally, the association was specific  
22 among these farmers. An association with  
23 herbicide use was limited to  
24 non-Hodgkin's lymphoma and could not be  
25 explained by education, income,



1 ethnicity, expenditures on fuel or use of  
2 fertilizers or insecticides."

3 Do you agree with that assessment, Dr.

4 Rodricks?

5 A. Largely. He ought to have said that  
6 there was an independent association with expenditures  
7 on fuel of a similar magnitude of risk, but that still  
8 would not -- that observation wouldn't discount the  
9 finding with respect to NHL, so that's correct.

10 Q. So you agree with that paragraph--

11 A. Yes.

12 Q. --subject to the comment you just  
13 made.

14 Now, continuing with the Blair  
15 commentary, we're now looking at the third full  
16 paragraph on the right-hand column. Blair states that:

17 "The Wigle study has provided new  
18 information that supports the hypothesis  
19 that contact with herbicides increases  
20 risk of non-Hodgkin's lymphoma among  
21 farmers."

22 Just stopping there, do you agree with  
23 that assessment?

24 A. Yes, I'd have to say it supports the  
25 hypothesis.

1 Q. Going on in the same paragraph, Dr.  
2 Rodricks - actually, thanking you for turning the sign  
3 in this direction, it does actually help.

4 Dr. Blair goes on to state in this  
5 paragraph:

6 "Case..."

7 A. May I, I should qualify that last  
8 statement with respect to the discussion that we had  
9 earlier that you do have this unusual and unexplained  
10 difference between small and large farms. It is  
11 unexplained and a bit of a mystery.

12 Q. All right, fine. The second sentence  
13 in the third full paragraph on that page states:

14 "Case control studies have observed  
15 non-Hodgkin's lymphoma associated with  
16 phenoxyacetic acid herbicides  
17 (References 3 to 7) and, in particular,  
18 the phenoxyacetic acids 2,4-D...", and  
19 the references there are 3 and 4. 3 and 4 are the  
20 Swedish studies and the Kansas studies respectively.  
21 Do you agree with that assessment?

22 A. Those are the two that isolated, to  
23 the extent they could, possible associations with 2,4-D  
24 specifically, yes.

25 Q. And do you agree with Dr. Blair's

1 assessment or statement?

2 A. Associated, yes, mm-hmm.

3 Q. Now, continuing with Dr. Blair's

4 commentary. I'm referring you now to the last

5 paragraph on page 544 of Exhibit 1248, column 2, the

6 last paragraph on the page. Dr. Blair states:

7 "Excesses of non-Hodgkin's lymphoma have

8 been reported among farmers in various

9 countries, the epidemiologic --", I'm

10 having trouble with that word today,

11 "...evidence points toward involvement of

12 phenoxyacetic acid herbicides and, in

13 particular, 2,4-D but there are

14 inconsistencies. The experimental

15 evidence is unimpressive. The

16 International Agency for Research on

17 Cancer concluded that the evidence for

18 carcinogenicity of 2,4-D and 2,4,5-T in

19 animals is inadequate."

20 And the reference there is to the pages

21 of the IARC report that I have now filed in this

22 hearing and are Exhibit 1252.

23 Continuing with the paragraph:

24 "This presents a dilemma to the

25 scientific community in how to draw

1 conclusions regarding carcinogenicity of  
2 a substance when the epidemiologic and  
3 experimental data do not agree,  
4 especially in situations where the..."  
5 human "...evidence is positive and  
6 experimental evidence is negative."

7 Now, just stopping there, Dr. Rodricks.  
8 The reference to experimental evidence is to animal  
9 studies; is that correct?

10 A. Generally, although it might include  
11 other kinds of studies related to carcinogenicity as  
12 well.

13 Q. All right. Now, Dr. Blair states  
14 that the human evidence points toward involvement of  
15 2,4-D in particular in NHL cases, and that the human  
16 evidence is positive while the experimental/animal  
17 evidence is not.

18 Do you agree with Dr. Blair that the  
19 human evidence with respect to 2,4-D is now positive?

20 MADAM CHAIR: Excuse me. I find it  
21 difficult when you refer to epidemiological evidence as  
22 being human evidence. I'm getting confused with  
23 diagnostic results as opposed to --

24 MR. CASTRILLI: I'm using the two terms  
25 synonymously mainly because for some reason I'm having

1 difficulty saying epidemiology today.

2 Q. Is there a difference, a material  
3 difference for the purposes of our discussion, Dr.  
4 Rodricks?

5 DR. RODRICKS: A. There is no human  
6 evidence of, let's say, clinical type with any of these  
7 materials. There are -- although there are few  
8 controlled human studies where they have looked at the  
9 metabolism of 2,4-D in humans and the extent of  
10 absorption through the skin, no other kinds of human  
11 studies. So for almost all of the data human and  
12 epidemiological are synonymous.

13 DR. RACHMAN: A. Mr. Castrilli, you  
14 might find the convenient term epi studies of some help  
15 here. We sort of use that as jargon.

16 Q. Dr. Rachman, I am forever in your  
17 debt.

18 DR. RODRICKS: A. Epi studies would be  
19 fine.

20 Q. That will be terrific. All right.  
21 Let me repeat the question then using that epi  
22 grammatic phrase instead of the longer word I'm having  
23 some difficulty with this morning.

24 Dr. Blair states that the epi evidence  
25 point towards involvement of 2,4-D in NHL cases and



1       that the epi evidence is positive while the animal  
2       evidence is not.

3               Do you agree with Dr. Blair that the epi  
4       evidence with respect to 2,4-D is positive?

5               A. No, if by positive he means a causal  
6       relationship has been established, or if he even means  
7       that there is limited evidence in the case of 2,4-D.

8               If in the first sentence he says the  
9       epidemiologic evidence point towards involvement of  
10      phenoxyacetic herbicides, it points toward involvement  
11      means suggestive or limited evidence, I would agree.

12              I don't agree that in particular 2,4-D,  
13      the evidence even reaches the level of limited. I'd  
14      prefer the inadequate characterization as set forth by  
15      the MOE. There are inconsistencies --

16              Q. Excuse me, I'm sorry.

17              MR. CASSIDY: Let him finish his answer.

18              MR. CASTRILLI: No, I didn't hear his  
19      answer, that's why I interrupted. I'm sorry.

20              DR. RODRICKS: I said, if in the first  
21      sentence -- the second sentence of the paragraph when  
22      he says points toward involvement he means there is  
23      suggestive or limited evidence for phenoxies in NHL, I  
24      would agree with that. I'm not quite sure what points  
25      toward means, but if it means limited or suggestive

1 evidence, I would agree with that.

2 Where he says in particular 2,4-D, I  
3 don't read the evidence as pointing particularly to  
4 2,4-D and would agree with the MOE's characterization  
5 on 2,4-D in particular, that the evidence is inadequate  
6 to support even suggestion or even limited evidence,  
7 it's the inadequate category that they have put 2,4-D  
8 specifically into, I agree with that, and certainly the  
9 Wigle study doesn't say -- isn't convincing on 2,4-D.  
10 So I would change that sentence a bit.

11 But there are inconsistencies, is  
12 certainly true. He talks about the experimental  
13 evidence and I guess obviously he does not have access  
14 to the more recent animal studies. He cites only the  
15 IARC conclusion on the animal studies.

16 And in the last sentence, if by positive  
17 with respect to the epidemiologic evidence he means a  
18 causal relationship, then I don't agree with that. Is  
19 that clear?

20 Q. Yes, I think it is. Let me just  
21 follow up on a couple of points. MOE produced a report  
22 in 1987 which of course could not have taken into  
23 account the Wigle study; is that right, and it clearly  
24 doesn't?

25 A. It does not, that's right.

1 Q. And as you will recall from our  
2 discussion yesterday, Dr. Rodricks, the Wigle study  
3 reports that 2,4-D constituted over 90 per cent and 75  
4 per cent by weight of all herbicide active ingredients  
5 used agriculturally in Saskatchewan during the test  
6 period. And as I recall, you indicated you did not  
7 have any better information with respect to that?

8 A. No, I do not.

9 Q. This study has not yet been  
10 considered by IARC; is that right?

11 A. The Wigle study has not.

12 Q. Yes.

13 A. Nobody has considered it; that is, no  
14 review group has considered it.

15 Q. This is going to add to the weight of  
16 evidence with respect to an association; is it not,  
17 between 2,4-D and NHL?

18 A. Well, the Wigle study is interesting  
19 but it is not an analytic study. An analytic study is  
20 one where they collect individual -- as much as they  
21 can, exposure information specific to individuals. In  
22 all of the other studies we're dealing with, the case  
23 control studies and the cohort studies, have some  
24 information on individual exposure.

25 This is a very interesting study but it

1 is what is called ecologic in nature and the outcome is  
2 one that would suggest further investigation. It's  
3 typically -- these kinds of studies are those that  
4 usually lead to analytic studies. This comes sort of  
5 late in the process and suggests two possible  
6 associations that need to be followed up with analytic  
7 studies, you know, where you try to get some specific  
8 information.

9 I just don't -- I don't have a good sense  
10 how much this adds and I certainly couldn't second  
11 guess an IARC group or another group to look at it from  
12 the MOE. I don't think it pushes the evidence into the  
13 causal category for NHL.

14 Q. Perhaps we should explore what you  
15 mean by causal as a scientist. Could you do that for  
16 me, because I'm now beginning to be a little bit more  
17 puzzled about it than I was when I first heard your  
18 evidence yesterday. What do you mean by it?

19 A. Yes. Well, the criteria that IARC in  
20 the document that you asked me to read are pretty good  
21 on that and they're much like the criteria I laid out  
22 in my overhead yesterday and, as I say, there is no  
23 single definition of the term, it really is an expert  
24 judgment based on the combined evaluation of a lot of  
25 data where the sum total of data allows you to



1 eliminate questions of possible bias and confounding so  
2 that you're quite confident that you've identified the  
3 causal agent in whatever these associations are that  
4 have been recovered.

5 And I point to some other chemicals where  
6 you have good -- if you look at the chemicals that IARC  
7 has placed in their category 1, sufficient evidence,  
8 the evidence is clearly distinguishable from what we  
9 have seen here so far. There are -- usually, first of  
10 all, convincing experimental animal evidence is part of  
11 it, there is strong dose response information if we  
12 look at materials like benzene or arsenic or DES or  
13 cadmium inhaled or chromium inhaled, good strong dose  
14 response information, the elimination of confounding  
15 factors and other chemicals from the process, a  
16 consistent pattern of results and strong statistical  
17 associations consistently.

18 Those are the general criteria, but it  
19 really takes -- and that is why the sort of expert  
20 panel report approach where you gather experts to look  
21 collectively at the data - IARC does that - is very,  
22 very important in that process. It really isn't any  
23 individual scientist's judgment. Individuals may  
24 have -- will have different judgments, but these panels  
25 try to work towards some consensus, weighing the total



1 body of evidence.

2 And, as I said, the MOE has done that in  
3 the Harvard Panel but now absent the Wigle data, and I  
4 certainty couldn't predict whether either of those  
5 panels would see the Wigle study as pushing the  
6 evidence clearly into the causal range; I mean, it's  
7 not an analytical study and I don't think it does that,  
8 but I certainly couldn't judge whether other panels  
9 might, I mean whether an expert panel might do that.

10 Q. Is Blair's position a reasonable view  
11 for a member of the scientific community to take?  
12 Whether or not you agree with him, is it a reasonable  
13 view to take with respect to the carcinogenic potential  
14 of 2,4-D vis-a-vis NHL?

15 Q. Well, first of all, what statement  
16 here do you read as his view?

17 Q. The one we were just focussing on a  
18 moment ago at the bottom of page 1248.

19 A. Where the epidemiologic evidence is  
20 positive and experimental evidence is not?

21 Q. Yes.

22 A. You see that as his view. If by  
23 positive he means causal, no, I don't think that it  
24 really reaches that stage, certainly not for 2,4-D, and  
25 I don't believe also for phenoxies in general.

1                   If he means there is limited or  
2 suggestive evidence, words to that effect by positive,  
3 then I would agree for phenoxys and NHL. So I don't  
4 know what he means by positive.

5                   Q. And I don't want to dwell on this  
6 issue of causality in a scientist's term, but I think  
7 it would be important for the Board to understand, a  
8 scientist requires certainty with respect to a causal  
9 relationship before he's prepared to conclude there's a  
10 causal relationship; is that right?

11                  A. Well, not certainty but - you don't  
12 have certainty in any scientific undertaking - but you  
13 want to eliminate possible bias and confounding and  
14 inconsistencies, have explanations for inconsistencies  
15 to a very high degree.

16                  Q. Now, I notice that Dr. Blair says  
17 that the experimental evidence is unimpressive - and I  
18 presume again he means the animal evidence is  
19 unimpressive - and he's referring to the body of animal  
20 studies that you have discussed over the last - I  
21 presume he's referring to the body of animal studies,  
22 that is the collective font of knowledge of the  
23 scientific community with respect to 2,4-D - and he  
24 calls the experimental evidence less than -- if I can  
25 put it this way, he seems to call it less impressive

1       than what it appears to be, in his view, for the epi  
2       studies.

3                   Is that a fair interpretation of what  
4       he's saying, in your view?

5                   DR. RACHMAN:  A.  I'm laughing, Mr.  
6       Castrilli, because there can be considered to be  
7       somewhat of a rivalry between people who do animal  
8       studies and people who do epidemiology.  Each group  
9       seems to feel that their approach to the problem is the  
10      best and they are always trying to establish the  
11      primacy of their own particular group.  So I find that  
12      amusing in this context.

13                  Q.  I see.  All right, thank you for  
14      that.  What do you think --

15                  DR. RODRICKS:  A.  Unimpressive is an  
16      ambiguous word and I sort of assume he meant that it  
17      didn't show a convincing case for carcinogenicity.

18                  Q.  Well, not to put too great an  
19      emphasis on it, even if we just simply looked at  
20      Exhibit 1252 where IARC concludes that the evidence for  
21      phenoxies as a class is limited and the evidence with  
22      respect to 2,4-D and 2,4,5-T is inadequate, just taking  
23      it from that perspective, would you agree that -- and  
24      the limited category is enough for IARC to conclude, or  
25      the assessment of limited evidence with respect to the

1        epi studies is enough for IARC to conclude that 2,4-D  
2        is a possible human carcinogen in the phenoxy class  
3        with respect to the phenoxies.

4                    A. No, IARC concluded that for the  
5        chlorophenoxy class of compounds there was limited  
6        human evidence, inadequate animal evidence.

7                    He is citing IARC's conclusion on the  
8        animal evidence here as inadequate and that is an  
9        accurate citation of what they said. I add to that the  
10       fact that there is this two-year bioassay in mice and  
11       rats now submitted to EPA and reviewed by the MOE and  
12       by the Harvard Panel, so that is additional data, but  
13       it's not published data. It's submitted in the  
14       regulatory -- under the regulatory requirements of the  
15       EPA, and that's a part of this discussion and I guess  
16       it couldn't be, he wouldn't necessarily have access to  
17       that data, so he simply cites the IARC conclusion from  
18       the animal data.

19                   Q. And we've already gone through this.  
20       The data that you're referring to, the new 2,4-D data,  
21       is the data from 1986 which is still being examined and  
22       re-examined, or else -- sorry, that data was filed in  
23       1986.

24                   U.S. EPA said that it didn't reach the  
25       maximum tolerated dose, it wanted the studies done



1 again and they're in the process of being done now; is  
2 that right?

3 A. I don't know where they are in that  
4 process, but I understand they're being redone, yes.

5 Q. All right. So EPA is not going to  
6 rely on the studies that were filed in 1986, it's  
7 relying on the studies it hopes will be done properly  
8 and are currently in the process of being done.

9 A. That's their opinion yes.

10 Q. All right.

11 DR. RACHMAN: A. Let me clarify that.

12 Q. Please do.

13 A. An important important is that if the  
14 EPA were to decide to do any kind of interim risk  
15 assessment before the repeated animal studies were made  
16 available, they would take the approach that Dr. Crump  
17 and his associate took, or that the MOE Panel took  
18 which is to use the existing evidence and make some  
19 worst case assumptions about the carcinogenic potency  
20 of 2,4-D and they would proceed on that basis. They  
21 have not chosen to do that to this point.

22 Q. And that's an option that's open to  
23 them; is that right?

24 A. Yes.

25 Q. Now, just to clarify this last point,



1 Dr. Rodricks. The conclusion of IARC with respect to  
2 the chlorophenoxy herbicides as a class is that they  
3 are a group 2B carcinogen and that is based -- appears  
4 to be solely based on the evidence for carcinogenicity  
5 to humans which they describe as limited but limited is  
6 enough to get you into the group 2B class which is  
7 defined as possibly carcinogenic to humans; isn't that  
8 right?

9 DR. RODRICKS: A. That's right.

10 Q. So limited in the context of IARC  
11 means, in this context, for this particular class of  
12 compounds, translates into possibly carcinogenic to  
13 humans; isn't that right?

14 A. Possibly, but just keep remembering  
15 causal relationships get you into first class and they  
16 have not reached the conclusion about causation. It's  
17 only the class they call sufficient evidence of  
18 carcinogenicity in humans where causation has been  
19 established; under limited evidence, they say causation  
20 is possible or credible but other factors; bias, other  
21 confounding factors cannot be ruled out. That's the  
22 limited definition, and that's I believe the case we  
23 have with NHL and phenoxy herbicides.

24 Q. Okay. Now, are there known  
25 carcinogens with positive epi studies but negative

1 animal data or inconclusive animal data?

2 A. I know of only one.

3 Q. Arsenic?

4 A. Yes.

5 Q. And at the moment we have animal  
6 evidence with respect to 2,4-D's carcinogenicity which  
7 is inadequate; is that right?

8 A. In IARC's term, yes, mm-hmm,  
9 inadequate to reach a conclusion of carcinogenicity.

10 Q. Can you confirm for me, Dr. Rodricks,  
11 that the Ministry of the Enviornment used animal data  
12 to do its cancer risk model?

13 A. The Ministry of the Enviornment  
14 expert report?

15 Q. Yes.

16 A. Okay, that's Exhibit 714?

17 Q. Yes. You might want to refer to page  
18 51.

19 A. Well, the discussion of it begins on  
20 page 49.

21 Q. You're right, the discussion begins  
22 on 49. A fairly quick reference to it can be found on  
23 page 51, Table 8.

24 A. I'm sorry, is there a question before  
25 me or --

1 Q. Yes.

2 A. What was the question?

3 MADAM CHAIR: Excuse me. What page is  
4 that, Mr. Castrilli?

5 MR. CASTRILLI: Page 51 of Exhibit 714.

6 MADAM CHAIR: Thank you.

7 DR. RODRICKS: I'm sorry, I guess I don't  
8 know the question.

9 MR. CASTRILLI: Q. Sorry, I was going to  
10 repeat the question. Can you confirm for me that the  
11 Ministry of Environment used cancer risks derived from  
12 animal data for their risk assessment?

13 DR. RODRICKS: A. Yes, they did,  
14 although these are what they call hypothetical risks  
15 because, as they say on page 49 under Section 9, the  
16 last sentence:

17 "These estimates are not intended  
18 necessarily to be accurate as to its risk  
19 nor should the fact that these  
20 calculations were made be interpreted as  
21 implying that the panel believes that  
22 2,4-D is a carcinogen."

23 Q. I'm sorry, I didn't mean to import  
24 that assessment into their conclusion. All I wanted to  
25 confirm was what they did was they used animal data to

1 do their cancer risk assessment and you --

2 A. They did, they asked the question - I  
3 think I went through this with my oral evidence  
4 yesterday - that they picked the highest response in  
5 this animal study that would be not inconsistent with a  
6 positive outcome, even though they did not agree the  
7 evidence was sufficient to call it carcinogen, they did  
8 what they call a hypothetical risk based on that  
9 premise, and that is the result of which is presented  
10 in Table 8, Part 1.

11 They also include some data that they  
12 described earlier with respect to exposures that  
13 various workers would incur. There's a section earlier  
14 on the exposure elaboration.

15 Q. And what MOE used -- sorry, the  
16 animal data that MOE used was the ITF study; isn't that  
17 right?

18 A. Yes.

19 Q. Thank you. Now, can you also confirm  
20 for me, Dr. Rodricks, that Crump also relied on animal  
21 data to do his cancer risk assessment?

22 A. Although not the same set of data,  
23 the same set of data were not available to him.

24 Q. Sorry, perhaps we should refer to  
25 Exhibit 716.

1 A. That's Crump?  
2 Q. Yes.  
3 A. The Crump report?  
4 Q. Yes, the Crump report, Exhibit 716.  
5 Sorry, page 130.  
6 A. 130, Table 4-8?  
7 Q. Well, actually -- yes, that's one  
8 place to look. Footnote (b) I think will tell you.  
9 A. Do you want me to read footnote (b)?  
10 Q. Yes. You don't need to read it into  
11 the record.  
12 A. Yes.  
13 Q. And, in particular, the study that  
14 Crump used was the Hanson report or the animal data  
15 that Crump used was from the Hanson report; isn't that  
16 right?  
17 A. That's right.  
18 Q. And that's referred to at page 109 of  
19 Crump?  
20 A. Yes.  
21 Q. I believe it's the third full  
22 paragraph.  
23 A. Third paragraph at 109.  
24 Q. Yes. Do you want to take a moment to  
25 read it, or do you need to?



1 A. Yeah, I remember this.

2 Q. Okay. And the Hanson study is one of  
3 the studies that you identified in your evidence  
4 yesterday with respect to animal carcinogenicity on  
5 2,4-D as one of the old studies?

6 A. Yes, '71.

7 Q. Do these studies establish a reliable  
8 dose response?

9 A. Well, you've got to be careful on  
10 this study. The dose response, as I recall, he reports  
11 in a table - he being Crump - Table 4.3, page 125.

12 The procedure for determining whether a  
13 material is an animal carcinogen is to look at -- when  
14 the pathologist examine animals after they've been  
15 treated they look at about 40 different sites of the  
16 body for presence of tumors, both benign and malignant  
17 tumors, and they tabulate them by sites of the body;  
18 liver, brain, et cetera.

19 The current criteria in the United  
20 States, and I believe everywhere, for determining  
21 whether something is a carcinogen is to look at the  
22 rates of tumor formation site by site, and so you  
23 conclude something would be a brain carcinogen or a  
24 liver carcinogen or a lung carcinogen, et cetera.

25 This study is negative when you do that

1 sort of analysis. To make it positive for doing a kind  
2 of worst case analysis, Crump in this report just  
3 tabulated all types of tumors combined throughout the  
4 study and that's what is presented in Table 4.3. He  
5 needed something to do this hypothetical risk  
6 assessment on, and so he used the sort of worst case  
7 analysis based on the findings of all types of  
8 malignant tumors and there is a slight trend in that.

9 That would not be enough to label  
10 something carcinogen by current criteria, but it's  
11 certainly adequate for doing the sort of upper bound  
12 potency estimate that Dr. Crump did.

13 I hope I answered your question because I  
14 sort of forgot what it was. You asked me whether there  
15 was a dose response relationship?

16 Q. Yes.

17 A. Yes. And that's what's in this  
18 table, and it was the basis for the risk assessment  
19 that he did.

20 Q. Now, Dr. Rodricks, I want to refer to  
21 your evidence again at page (x), actually it's in  
22 several places but it's certainly at page (x).

23 You state that you agree with the MOE  
24 Panel's conclusion that there is insufficient evidence  
25 to conclude that existing uses of 2,4-D in Ontario pose

1 a significant human health risk.

2 And then if I could just direct your  
3 attention to page 66. Actually you basically restate  
4 that proposition on this page, and arising from that  
5 conclusion, or those conclusions I assume that what we  
6 have at page 62 of your evidence in the middle  
7 paragraph is the view that what we should do with 2,4-D  
8 in Ontario is continue to carefully monitor its use; is  
9 that a fair statement, the portion that's in-italics?

10 A. We were referring to monitoring here  
11 I guess in the epidemiologic sense, that this is  
12 something that needs further investigation.

13 Q. All right. So am I right to make --

14 A. I didn't mean environmental  
15 monitoring, if that's what -- maybe monitoring is not a  
16 good word here because that sometimes implies  
17 environmental monitoring.

18 Q. I'm sorry. Why don't you just  
19 clarify what you meant by monitoring then.

20 A. Here we are referring to epi studies  
21 and investigation into possible human carcinogenicity  
22 and this simply suggests that, what many others have  
23 suggested, this needs additional evaluation; we  
24 shouldn't stop and feel comforted we answered the  
25 question conclusively nor should we believe that the

1 material is now shown to be a human carcinogen. But  
2 there certainly is enough here to continue evaluating  
3 its possible health effects.

4 Q. Is that a scientific judgment or a  
5 value judgment?

6 A. I guess it has components of both.  
7 Scientifically no question is ever answered  
8 definitively. So I guess in a purely scientific matter  
9 you always like to see additional investigation.

10 In this case there is reason for  
11 additional investigation through experimental studies  
12 or epidemiology studies. I guess we have nothing more  
13 than that.

14 MADAM CHAIR: You have put your finger,  
15 Dr. Rodricks, on what makes the scientific viewpoint  
16 sort of unpalatable to a public; and, that is, it's  
17 fine to say, yes, we've looked at this and we've looked  
18 at that and our view is more research, more study,  
19 more experimental work and we'll see what happens,  
20 certainly that makes sense from the line of work that  
21 you do absolutely.

22 DR. RODRICKS: Mm-hmm.

23 MADAM CHAIR: But I think it's always  
24 been a very difficult thing to communicate publicly to  
25 people who may fear any exposure they have to a

1 chemical agent.

2 DR. RODRICKS: I understand that but, I  
3 mean, I guess you've got to make decisions at given  
4 points in time and that's where science can sometimes  
5 clash a bit.

6 You know, I think with this evidence, so  
7 far as a scientific matter in the absence of any clear  
8 causal picture and with the comfort provided by the  
9 risk analyses before you, I don't see any scientific  
10 basis for assuming a significant risk with these uses.  
11 There is additional animal work underway - maybe you  
12 can't wait for that to be completed.

13 I mean, I personally think that it's  
14 going to be very hard with this kind of material ever  
15 to pin this down epidemiologically. I mean, it's hard  
16 to think of new kinds of studies you can do, and that's  
17 what you really need to do, and I think that's going to  
18 remain in the sort of limited category - that's just my  
19 personal judgment - for some time, unless we see some  
20 very unusual finding that we've not seen before, some  
21 very striking effect, but I really don't expect that,  
22 that's just a guess.

23 And that we're working right at the  
24 limits of epidemiological science and I would say,  
25 based on what we know now from animal studies at least,



1           that there's a basis for concluding there is not a  
2           significant risk in this setting, but that we should  
3           certainly watch the new studies and our minds may  
4           change if they reveal something more risky in future.

5                       I mean, that's always going to be the  
6           case; you make a decision today and new data may come  
7           along to change the situation in future. That's always  
8           going to happen. I just don't expect it to come from  
9           the epidemiologists.

10                      MADAM CHAIR: Are you suggesting on page  
11           62, your comment about the use of 2,4-D should be  
12           carefully monitored, are you suggesting long-term  
13           population monitoring by that, or are you suggesting  
14           more scientific research?

15                      DR. RODRICKS: Maybe this is not  
16           perfectly clearly labeled. I simply meant that we  
17           would support -- I mean, there are now efforts to look  
18           in other populations, the Canada studies go on, there  
19           are studies in Iowa and work in --

20                      DR. RACHMAN: Minnesota.

21                      DR. RODRICKS: --in Minnesota underway  
22           and that's all to be encouraged, the animal studies are  
23           to be encouraged.

24                      MADAM CHAIR: Do you know of any -- in  
25           those jurisdictions if they have, in the Iowa,

1 Minnesota and Nebraska studies, do they set up  
2 population registries on uses to get a better handle on  
3 exposures?

4 DR. RACHMAN: Madam Chair, I'm not  
5 positive about this but I believe that the State of  
6 Iowa may have a cancer registry. I could find out  
7 about that for you, if you like.

8 DR. RODRICKS: We have not looked into  
9 that very much.

10 MR. MARTEL: But do you error on the side  
11 of safety then? In making decisions, somebody has to  
12 make them, do you error on the side of safety or do you  
13 continue to take a chance until the final -- or as  
14 definitive a statement that can be obtained is made?

15 DR. RODRICKS: Well, if you believe you  
16 are taking a significant chance, I mean, that's policy  
17 a question, I wouldn't certainly support that. I take  
18 comfort from what the MOE Panel has said.

19 We went through this report very  
20 carefully, I know some of the people on the panel and I  
21 certainly know the reputations of the others. I think  
22 they did a very good review, and it certainly doesn't  
23 answer every single question but we have got as many  
24 answers there as we have got for almost any chemical  
25 pesticide or otherwise. There is some residue of

1           uncertainty there, but I don't think it's very much.

2                   MR. MARTEL: But in the battle to  
3           establish over the years the links in various fields  
4           whether it's in a certain plant situation, a certain  
5           chemical, chromium, cadmium you name them--

6                   DR. RODRICKS: Right.

7                   MR. MARTEL: --that's always been the  
8           battle, I guess, for people who are trying to  
9           establish. At the beginning there was always so much  
10          doubt by the scientific community, in fact in many of  
11          those instances people literally flew by the seat of  
12          their pants and didn't seem to get much help from the  
13          scientific community.

14                   I think that's what causes so much  
15          concern amongst people, that the assistance when needed  
16          as to scientific community battle back and forth yes or  
17          no, people died in the process and a lot of people  
18          without very much scientific background actually were  
19          able to force decisions which protected people.

20                   DR. RACHMAN: Well, Mr. Martel, isn't it  
21          a fact, Dr. Rodricks, that the whole technique of risk  
22          assessment really developed to try and assist  
23          decision-makers with just that kind of a situation, to  
24          provide a framework for making decisions when  
25          uncertainty exists and the information is not clear.

1 Do you agree with that?

2 DR. RODRICKS: Yes, and the approach has  
3 been - and Crump does this - is to look at kind of a  
4 worst case picture as a basis for a decision. If the  
5 risks are very low under those circumstances, you have  
6 some comfort and can explain that decision, I think. I  
7 understand the difficulty.

8 Epidemiology data though really cloud the  
9 picture, they always do. There have been a lot of  
10 associations in the past with chemicals or factors in  
11 the environment to human health, some of the which have  
12 gone away with time and others of which have become  
13 convincing. About 30 environmental agents I think is  
14 the common total where you have, to quote IARC,  
15 sufficient evidence, but there are a lot of others that  
16 have never reached that level, a lot of these  
17 associations are around.

18 MADAM CHAIR: Would you say that much of  
19 the evidence we have looked at over the last two days  
20 is more applicable to occupational exposure or direct  
21 exposure as opposed to an overall--

22 DR. RODRICKS: General population.

23 MADAM CHAIR: --population exposure?

24 I'm not saying it's been established, but saying that  
25 it's tenuous in the circumstances that we've looked at,



1           how do you extrapolate that to a general population?

2                       DR. RODRICKS:   Okay.   All of the studies,  
3           almost all of the studies -- I guess all of the studies  
4           concern occupational exposure, which I guess most  
5           people would agree would be more intense than exposure  
6           incurred by most of the rest of us.

7                       MADAM CHAIR:   Well, there are specific  
8           exceptions--

9                       DR. RODRICKS:   Probably --

10                      MADAM CHAIR:   --that you will probably be  
11           hearing about later on today.

12                      DR. RODRICKS:   At any rate, and of course  
13           epidemiologists turn to the occupational setting  
14           because that is where the exposures are most intense,  
15           and you can identify specific populations and get some  
16           health information, it's possible to study that.

17                      If you had convincing data from an  
18           occupational setting on carcinogenicity, I would  
19           consider that relevant to other populations even though  
20           they would be at lower risks, and the risk assessor  
21           could be asked to say how much lower risk, giving  
22           differential exposures, you know.

23                      So even though they are not directly  
24           applicable, at least in theory one would -- there's a  
25           fairly good basis to assume chromium when inhaled



1 causes a risk of cancer in the workplace in the lung.  
2 There's evidence to that, in fact I would be concerned  
3 about a possible risk, although it might be very, very  
4 much lower for the general population, and the risk  
5 assessment process is designed to answer that question  
6 for you, or at least put some upper bound on the risk.

7 So it's relevant in that sense, I would  
8 think, if that answers your question. I would  
9 certainly consider occupational studies relevant more  
10 broadly.

11 MADAM CHAIR: Sorry, Mr. Castrilli.

12 MR. CASTRILLI: All right, Madam Chair.

13 It's clear that I'm not going to be finished by noon.

14 MADAM CHAIR: How much more do you have?

15 MR. CASTRILLI: I would think I'll be  
16 finished by the afternoon break.

17 MADAM CHAIR: So you have another hour,  
18 hour and a half?

19 MR. CASTRILLI: Well, probably. I don't  
20 even think I'll get to the afternoon break, but in any  
21 event, I'm not going to be finished in the next four  
22 minutes.

23 MADAM CHAIR: All right.

24 MR. CASTRILLI: Q. Dr. Rodricks, let's  
25 continue with you. You've indicated that your

1 conclusions from the pages I've referred you to are a  
2 mixture of scientific judgment and value judgment. Can  
3 I just ask you --

4 DR. RODRICKS: A. With respect to  
5 additional studies you mean, I guess. Is that the part  
6 of the -- the statement about the conclusion that 2,4-D  
7 is a human carcinogen is a scientific evaluation.

8 Q. And when we look at page 62, a view  
9 that I gather you support is that use of 2,4-D should  
10 be carefully monitored, and I take from that what is  
11 not -- from what is not there, that other  
12 restrictions - I don't take a monitoring recommendation  
13 as a restriction - any restrictions are not warranted  
14 based on the data as you've evaluated it; is that what  
15 you're telling this Board?

16 A. Yes. You mean, regulatory sort of  
17 restrictions--

18 Q. Yes.

19 A. --or something akin to those?

20 Q. Yes.

21 A. I don't see a basis for that now.

22 Q. Would you agree that deciding whether  
23 or not an estimated risk is significant enough to  
24 require regulation is not a scientific matter and is  
25 not part of the risk assessment process?

1           A. It is not part of the risk assessment  
2 process, it is separate, and it may not be scientific  
3 but that doesn't mean it's purely a guess either.

4           There is -- you can look at -- there are  
5 ways to analyse the problem and look at precedents and  
6 so forth, so it's analytic, should be in part analytic.  
7 I'm not sure I would call that scientific, but clearly  
8 different from the risk assessment, yes.

9           Q. And decisions about risk significance  
10 are in the realm of risk management, wich is really  
11 what society's values as reflected in a particular  
12 decision-maker may result in?

13          A. Yes.

14          Q. And the two may not be the same?

15          A. The two...?

16          Q. A risk assessor's conclusion and a  
17 risk manager's conclusion may not be the same.

18          A. Oh, sure.

19          Q. And we have seen some evidence of  
20 that in the last few days; have we not, Dr. Rachman,  
21 with respect to the risk management decisions as you  
22 called them of the U.S. Forest Service in Oregon and  
23 Washington and Oklahoma and Arkansas?

24          DR. RACHMAN: A. Well, I can't confirm  
25 that because I haven't had an opportunity to review the

1 risk assessments and look at the purely scientific  
2 conclusions about the risk, but I would expect that  
3 they're generally correct.

4 Q. Thank you. So that it would appear;  
5 would it not, that for some risk managers there is  
6 sufficient evidence to conclude that existing use of  
7 2,4-D does pose a significant risk warranting  
8 regulatory action beyond what we've seen from U.S. EPA?

9 DR. RODRICKS: A. Could you say that  
10 again?

11 Q. Sure.

12 A. Is there some evidence that...?

13 Q. That for some risk managers - and I'm  
14 thinking specifically of the U.S. Forest Service  
15 Records of Decision that I've filed before this Board  
16 and you've had an opportunity to look at - that there  
17 is sufficient evidence to conclude that existing use of  
18 2,4-D poses significant risk to human health that  
19 constitutes a basis for regulation beyond what U.S. EPA  
20 is prepared to do?

21 A. Well, from what I know I wouldn't  
22 conclude that. Somebody in the Forest Service has made  
23 a decision that relative to other special herbicides  
24 these risks were too high, but I can't conclude they're  
25 a significant risk without understanding the basis for



1           that conclusion, if you're asking me to conclude  
2           whether there's a significant.

3                       I don't think -- I didn't read those  
4           decisions as saying a significant risk exists, they  
5           said they balanced a number of things, health concerns  
6           among them, but were not very specific in those  
7           documents. I mean, I'd have to understand how they got  
8           from the risk evaluation to that conclusion before I  
9           would conclude that a significant risk existed.

10                      Q. Well, the documents speak for  
11           themselves and their conclusions about what they were  
12           going to do with 2,4-D speak for themselves.

13                      The Regional forester in the Ozarks is  
14           not going to permit 2,4-D use, period, irrespective of  
15           what U.S. EPA had to say about that; isn't that right?

16                      A. That's what he said. You're asking  
17           for my judgment on whether that was a good decision?

18                      Q. No, no, no, I'm not asking you for a  
19           judgment as to whether that's a good decision or not,  
20           simply that it has in fact -- it is a risk management  
21           decision that has been made that is different?

22                      A. From EPA's, for example?

23                      Q. From EPA's?

24                      A. Apparently, yes.

25                      Q. And the same is true for the Pacific



1 Northwest; isn't that right?

2 A. Yeah, EPA has made no such -- has  
3 laid down no such restriction.

4 Q. All right, thank you.

5 A. Even for food uses.

6 DR. RACHMAN: A. Mr. Castrilli, could I  
7 just call something to your attention--

8 Q. Yes.

9 A. --that I-think was illustrative here.  
10 I'm looking now at -- this is Exhibit 1236 which is the  
11 Forest Service Record of Decision for the  
12 Ozark/Ouachita Mountains.

13 Q. Yes. Page...?

14 A. 11.

15 Q. Page 11.

16 A. Something that caught my attention  
17 here, the last paragraph here. The regional forester  
18 says that:

19 "Adverse effects of herbicides is the  
20 most intense issue the public identified  
21 for us."

22 Somewhat later in the paragraph he says:

23 "We developed Alternative F in response  
24 to public concerns about potential  
25 adverse effects of herbicides."

1                   In reading this document my impression  
2                   was that the alternative that was chosen was not a  
3                   reflection of identified risks solely, but that public  
4                   perceptions of risks were also taken into account.  
5                   Whether or not those perceptions are accurate, the  
6                   public opinion was an important factor here.

7                   Q. Well, all that really says; would you  
8                   not agree, Dr. Rachman, that what goes into a risk  
9                   manager's decision is broader than what a risk assessor  
10                  may consider?

11                  A. Absolutely. I think what I took  
12                  exception to was your use of the term evidence. If you  
13                  might consider public opinion as evidence, I would  
14                  disagree.

15                  Q. As Dr. Rodricks has already told us  
16                  scientifically no question is ever answered  
17                  definitively, so it's clear that risk have got to  
18                  operate on a basis different than scientists; isn't  
19                  that right?

20                  DR. RODRICKS: A. That's correct. That  
21                  doesn't mean they should ignore science either.

22                  Q. It's just one of the factors to  
23                  consider; isn't that right?

24                  A. Pretty important I believe, but it's  
25                  certainly not everything, I would agree with that.

1 Q. Now, Dr. Rachman, just if you know,  
2 the requirements under NEPPA, National Environmental  
3 Protection Policy Act, in conjunction with the type of  
4 exercise that the Forest Services has undertaken  
5 require in fact a worst case analysis; isn't that  
6 right?

7 DR. RACHMAN: A. I'm afraid I can't  
8 confirm that Mr. Castrilli.

9 Q. You don't know. All right.

10 A. I'm not familiar with those  
11 regulations,

12 Q. All right, that's fine.

13 MR. CASTRILLI: Madam Chair, this would  
14 be an appropriate place to break, and I would  
15 anticipate being done when we resume within about 45  
16 minutes, so I would think I would be done certainly no  
17 later than about 2:30 this afternoon.

18 MADAM CHAIR: All right. Thank you, Mr.  
19 Castrilli.

20 MR. CASTRILLI: Thank you.

21 MADAM CHAIR: We'll see you this  
22 afternoon, Ms. Kleer?

23 MS. KLEER: I will be here.

24 MADAM CHAIR: Thank you. The Board will  
25 be back at 1:30.

1 ---Luncheon recess taken at 12:00 p.m.

2 ---On resuming at 1:35 p.m.

3 MADAM CHAIR: Please be seated.

4 MR. CASTRILLI: Q. Dr. Rachman, could I  
5 ask you to turn to page 5 of your evidence.

6 DR. RACHMAN: A. Yes.

7 Q. I'm sorry, I have -- page 6. You  
8 indicate on this page that the registrant must provide  
9 to EPA the name, nominal concentration and certified  
10 limits for each active ingredient and intentionally  
11 added inert, and for various impurities potentially  
12 present at a weight greater than one tenth of one per  
13 cent. Do you have Exhibit 789 in front of you?

14 A. What is it?

15 Q. It's a letter from --

16 MR. CASSIDY: Letter from Mr. Chang.

17 MR. CASTRILLI: Q. Letter from Chang,  
18 that's right.

19 DR. RACHMAN: A. Oh. Yes, it's here  
20 somewhere. Yes, I have it.

21 Q. I'd like to refer you to the -- these  
22 pages are not numbered sequentially, the easiest way to  
23 refer you to it would be the 7th page from the end of  
24 the document.

25 A. The 7th page.

1 Q. Which is the first page of the  
2 Monsanto material safety data on Vision.

3 A. On Vision, not on glyphosate?

4 Q. On Vision.

5 A. Okay. Hold on one second. Okay.

6 Q. On this page the information  
7 indicates that with respect to forestry use the  
8 glyphosate active ingredient constitutes 41 per cent of  
9 the formulated product and goes on to note that the  
10 inert ingredients constitute the remaining 59 per cent,  
11 with 15 per cent of that 59 per cent being surfactant.  
12 Do you see that?

13 A. Yes, I do see that.

14 Q. Are you aware, Dr. Rachman, whether  
15 the surfactant in Vision, also known as polyoxyethylene  
16 amine, or POEA, includes the substance 1,4-dioxane as a  
17 contaminant or incidental component of the formulation?

18 A. Mr. Castrilli, I have no knowledge of  
19 what the inert ingredients are in glyphosate. That's  
20 confidential business information in the United States,  
21 it's not available.

22 Q. I'm not asking you to deal with  
23 confidential business information. Do you have a copy  
24 of a letter dated December 5, 19 -- or actually it was  
25 a memorandum dated December 5, 1989 from J.B. Reid,



1 a memorandum dated December 5, 1989 from J.B. Reid,  
2 Pesticides Directorate, to regional pesticide officers.  
3 It's a document I provided to you yesterday.

4 DR. RODRICKS: A. I think you gave it to  
5 me, Mr. Castrilli.

6 Q. That is it.

7 A. It's not yet marked as an exhibit.

8 Q. No, that's right. That's right.

9 MR. CASTRILLI: Madam Chair, I'd ask that  
10 this document be marked as the next exhibit. It's a  
11 letter -- excuse me, it's a memorandum dated December  
12 5, 1989 from James B. Reid, Associate Director of Audit  
13 Enforcement Section of the Pesticides Directorate,  
14 Agriculture Canada, to regional pesticide officers, and  
15 the subject matter is contamination of formulation  
16 ingredient, glyphosate herbicide.

17 MADAM CHAIR: That will be Exhibit 1253.

18 ---EXHIBIT NO. 1253: Memorandum dated December 5, 1989  
19 from James B. Reid, Associate  
20 Director, Audit Enforcement  
Section, Pesticides Directorate,  
Agriculture Canada.

21 MR. CASTRILLI: Q. Dr. Rachman, I would  
22 I would like to refer you to Item 2 on page 1 under the  
23 heading, or the subheading Background.

24 DR. RACHMAN: A. Yes.

25 Q. It states:

1 component...", I'm sorry, let me read the  
2 first paragraph. Paragraph 1 states that:

3 "A private citizen associated with  
4 an environmental coalition arranged for  
5 an analysis of glyphosate formulation  
6 ingredient by a private laboratory."

7 And in paragraph 2 indicates that:

8 "1,4-dioxane was identified as a minor  
9 component, less than one per cent of a  
10 formulation ingredient surfactant  
11 polyoxyethylene amine (POEA) routinely  
12 used in glyphosate formulations."

13 Were you aware of that information before  
14 you gave your testimony yesterday?

15 A. No, I was not.

16 Q. I'd like to refer you to page 2 of  
17 what is now Exhibit 1253. We're looking at --

18 MADAM CHAIR: Excuse me. Mr. Castrilli,  
19 this correspondence, the Audit Enforcement Branch  
20 of...?

21 MR. CASTRILLI: Agriculture Canada.

22 MADAM CHAIR: Agriculture Canada, thank  
23 you.

24 MR. CASTRILLI: Madam Chair, I took the  
25 trouble to bring the telephone directory for the

1 trouble to bring the telephone directory for the  
2 Government of Canada for 1989 with me in case there was  
3 any question about that, and I can refer counsel to the  
4 various pages where Mr. Reid's name appears for that  
5 department.

6 I note, by the way, he received a  
7 promotion. He's identified in the telephone book as  
8 chief of that section, he was subsequently made  
9 associate director.

10 MADAM CHAIR: Our best wishes to Mr.  
11 Reid.

12 MR. CASSIDY: Having worked in government  
13 at one time, I realize that as soon as those things are  
14 published they're virtually out of date, those  
15 directories.

16 MR. CASTRILLI: Well, as far as I can  
17 tell it was a promotion as opposed to anything else,  
18 judging from the hierarchy within the telephone  
19 directory.

20 Q. Can I just refer you to Item 4 on  
21 page 2 Dr. Rachman.

22 DR. RACHMAN: A. Item 4. Yes.

23 Q. Item 4, yes. Mr. Reid states:

24 "The possibility of 1,4-dioxane appearing  
25 as an incidental component of POEA, the

1 suggested by the chemical structure of  
2 the surfactant."

3 Just stopping there, Dr. Rachman, do you  
4 agree with that assessment or have any better  
5 information?

6 A. I am not a chemist, Mr. Castrilli,  
7 and I really could not comment on this.

8 Q. Okay. Dr. Rodricks, are you in any  
9 better position?

10 DR. RODRICKS: A. Well, I used to be a  
11 chemist. Polyoxyethylene amine, I mean, the structure  
12 is quite apparent from that name. I would not have  
13 predicted 1,4-dioxane which is a cyclic chemical, based  
14 on that structure, but I am not sure. I had no  
15 previous knowledge of this matter.

16 Q. All right. And just moving to  
17 paragraph 5 -- sorry, paragraph 5 on page 2 of this  
18 exhibit, Mr. Reid states that:

19 "The fact that this appears to have been  
20 confirmed by actual analysis should not  
21 be either surprising or alarming."

22 Just dealing with the surprising part of  
23 that sentence -- actually I believe you've already  
24 answered from what you recollect of your chemistry,  
25 you're just not in a position to answer one way or the

1       you're just not in a position to answer one way or the  
2       other; is that right?

3                   A.   That's correct.

4                   Q.   All right.  And I'm not sure I asked  
5       this question of you, Dr. Rodricks.  Do you have any  
6       better information with respect to what is in the  
7       surfactant?

8                   A.   No, I have no knowledge of the  
9       surfactant.

10                  Q.   Now, on page -- returning to page 1  
11       of this exhibit, Mr. Reid states at paragraph 3 under  
12       the heading Background:

13                   "Recently there has been renewed interest  
14                   regarding the carcinogenic potential of  
15                   1,4-dioxane."

16                  Can you confirm for me that 1,4-dioxane  
17       is already regarded as a possible carcinogen to humans;  
18       Dr. Rachman or Dr. Rodricks?

19                  DR. RACHMAN:  A.  I cannot answer your  
20       specific question.  I would defer it to Dr. Rodricks.  
21       I am aware that the EPA has done risk assessment on  
22       1,4-dioxane.

23                  Q.   Let's deal with one thing at a time.  
24       Do you have a -- this is the other half of the same  
25       IARC document I filed earlier which has the remaining



1 information in respect to what I wanted to deal with  
2 today. IARC 1982 Monograph, Supplement 7, it's the  
3 larger of the two.

4 DR. RODRICKS: A. Yes.

5 Q. Do you have that, Dr. Rodricks?

6 A. I do.

7 MR. CASTRILLI: Madam Chair, I would like  
8 to make this the next exhibit.

9 MR. HUFF: (handed)

10 MR. CASTRILLI: Madam Chair, I suggest we  
11 identify this for the record as IARC Monograph,  
12 Supplement No. 7 and this is excerpts respecting  
13 1,4-dioxane.

14 MADAM CHAIR: That is Exhibit 1254.

15 MR. CASTRILLI: Yes, thank you.

16 ---EXHIBIT NO. 1254: Document entitled: IARC  
17 Monograph, Supplement No. 7, 1987  
excerpts re 1,4-dioxane.

18 MR. CASTRILLI: Q. Dr. Rodricks, can I  
19 refer you to page 201 of what is now Exhibit 1254.

20 DR. RODRICKS: A. I have it.

21 Q. On that page we have the IARC review  
22 of 1,4-dioxane.

23 MR. FREIDIN: What page again?

24 MR. CASTRILLI: Sorry, 201.

25 Q. We have under the heading B. Evidence

1 for carcinogenicity to animals, in brackets  
2 (sufficient), and perhaps what would be easiest and  
3 more helpful to the Board would be initially, Dr.  
4 Rodricks, for all of us to turn to page 30 of this  
5 exhibit.

6 This is a description prepared by IARC  
7 and I'm looking at the bottom of the page, their  
8 description with respect to experimental  
9 carcinogenicity data, and I just want to read a portion  
10 of this into the record under that heading:

11 "The evidence relevant to carcinogenicity  
12 in experimental animals is classified  
13 into one of the..." two "...following  
14 categories."

15 And again we had the discussion earlier,  
16 clearly this is animal test data only; is that right?

17 DR. RODRICKS: A. That's right.

18 Q. Now, looking at the heading or  
19 subheading Sufficient evidence of carcinogenicity, I  
20 want to read that into the record first:

21 "The working group considers that a  
22 causal relationship has been established  
23 between the agent and increased incidence  
24 of malignant neoplasms or of an  
25 appropriate combination of benign and

1 malignant neoplasms (as described on p.  
2 23) in (a) two or more species of  
3 animals or (b) in two or more independent  
4 studies in one species carried out at  
5 different times or in different  
6 laboratories or under different  
7 protocols.

8 Exceptionally a single study in one  
9 species might be considered to provide  
10 sufficient evidence of carcinogenicity  
11 when malignant neoplasms occur to an  
12 unusual degree with regard to incidence,  
13 site, type of tumour or age at onset.

14 In the absence of adequate data on  
15 humans, it is biologically plausible and  
16 prudent to regard agents for which there  
17 is sufficient evidence of carcinogenicity  
18 in experimental animals as if they  
19 presented a carcinogenic risk to humans."

20 And just stopping there, Dr. Rodricks, do  
21 you agree that this -- or do you agree with this IARC  
22 description of what it means to have sufficient  
23 evidence of carcinogenicity in experimental animals?

24 A.. Well, do I agree that that's IARC's  
25 definition of sufficient evidence? Yes, I agree that

1 IARC --

2 Q. Do you agree with IARC?

3 A. Yes.

4 Q. Thank you. I want to refer you back  
5 to page 201 of this exhibit, under the heading B.  
6 Evidence for carcinogenicity to animals, the IARC  
7 authors indicate that this evidence is sufficient, and  
8 I would just like to read the paragraph beneath it:

9 "Administration of 1,4-dioxane in  
10 drinking water at several dose levels to  
11 rats and male guinea-pigs produced  
12 adenomas and carcinomas of the liver in  
13 rats of each sex, hepatomas in  
14 guinea-pigs, carcinomas of the nasal  
15 cavity in male and female rats, and  
16 carcinomas of the gall-bladder in  
17 guinea-pigs. No increase in the  
18 incidence of tumours was observed in rats  
19 following its inhalation. It increased  
20 the incidence of skin tumours in mice  
21 when applied after...", Oh boy!  
22 "...7,12-dimethylbenz[a]anthracene."

23 That will do.

24 "In a mouse-lung adenoma assay,  
25 1,4-dioxane produced a statistically

1 significant increase in the incidence  
2 of tumours in males given an intermediate  
3 intraperitoneal dose. No such increase  
4 was noted in males given a lower or  
5 higher intraperitoneal dose or in females  
6 given three...", this is a  
7 tongue-twister, "...intraperitoneal doses  
8 or in either males or females given  
9 1,4-dioxane orally."

10 The summary description that I have read  
11 into the record with some difficulty of the animal  
12 studies performed with respect to 1,4-dioxane indicates  
13 that there is sufficient evidence to treat 1,4-dioxane  
14 as if it presented a carcinogenic risk to humans.

15 Do you agree with that assessment, Dr.  
16 Rodricks?

17 A. I believe -- I know the dioxane -- I  
18 know the carcinogenicity data for dioxane. I agree it  
19 is an animal carcinogen in two species.

20 Q. Now -- I'm sorry.

21 A. And that meets the criteria as an  
22 animal carcinogen in two different species of animals,  
23 producing tumors at several sites. I have been through  
24 the data and this is old data. And, yes, it's  
25 sufficient, meets the criteria for sufficient animal



1 evidence.

2 Q. As if it presented a carcinogenic  
3 risk to humans?

4 A. I would treat it as if there's a  
5 potential for human carcinogenicity, yes.

6 Q. Thank you.

7 A. As IARC says, it's partly based on  
8 science and biological plausibility and partly based on  
9 prudence.

10 Q. And overall IARC has classified  
11 1,4-dioxane as a group 2B carcinogen, and that is as we  
12 discussed earlier with respect to the phenoxy  
13 herbicides, as a chemical agent that is possibly  
14 carcinogenic to humans; is that right?

15 A. Yes.

16 Q. And do you agree with that  
17 assessment?

18 A. Yes.

19 Q. Do you agree with me as a scientist,  
20 expert in particular aspects of health matters in  
21 relation to chemical agents, that if you have two  
22 formulations of a product; one that has a surfactant  
23 that is possibly carcinogenic to humans and another  
24 that does not have this contaminant, that it would be  
25 prudent from a health standpoint to not use the

1 possible carcinogenic product in favour of the  
2 non-carcinogenic product?

3 A. I would not make a judgment based  
4 solely on the finding of carcinogenicity but would  
5 attempt to see whether any significant risk were  
6 created by this level of contamination.

7 The surfactant is not carcinogenic, as  
8 you just implied. There is, apparently based on the  
9 Exhibit 1253, dioxane is a contaminant in that  
10 surfactant. So I think it would be fairly, given what  
11 Dr. Crump has already gone with glyphosate and the  
12 exposures that might result from its use, it would be  
13 fairly straightforward to take -- assume this level of  
14 contamination to be correct, to look at what exposure  
15 might be created and assess the risk.

16 We're talking about one per cent of - I'm  
17 not going to try to do the calculation now, but you  
18 could work through such an estimation of risk - so I  
19 would want to look at that first.

20 Q. All right. Now -- I'm sorry.

21 A. I'm not saying -- it's used widely in  
22 many -- surfactants are soaps and I'm sure you can find  
23 dioxane in lots of different products.

24 Q. I'm not sure --

25 A. Whether they create a significant

1 risk depends on the level of exposure.

2 Q. I'm not sure I'm excited to hear  
3 that, I also don't know which soaps you're talking  
4 about.

5 But, Dr. Rodricks, would you agree with  
6 me that we're talking about an inert ingredient here.  
7 POEA is the surfactant and there's a contaminant or an  
8 incidental in POEA that constitutes -- sorry, that is  
9 1,4-dioxane.

10 Now, glyphosate is registered in the  
11 United States and registered in Canada on the basis of  
12 the active ingredient. Is the active ingredient  
13 pesticidally effective?

14 A. Is the active ingredient...?

15 Q. And it's registered on the basis of  
16 whether the active ingredient, among others things, is  
17 pesticidally effective, effective as a pesticide.

18 A. Yes.

19 Q. Why do we need a carcinogen in the  
20 inert to improve the efficacy of glyphosate?

21 A. A lot of commercial products have  
22 trace amounts of carcinogens, they're out there -- I  
23 mean, we've got three or 400 animal carcinogens  
24 identified perhaps and some of these are quite wide  
25 spread as trace contaminants of some products.

1                   In the United States the Environmental  
2           Protection Agency under the Toxic Substances Control  
3           Act and other agencies with controls over those  
4           products monitor them.

5                   I don't know whether it's possible to  
6           make this surfactant or any surfactant without such  
7           contamination or what's involved in that, I just don't  
8           know.

9                   Q.   Well, Dr. Rodricks, I put the  
10          proposition to you earlier:  If you had two products,  
11          both called glyphosate - and let me be clear about  
12          this - the evidence on the record and we just heard it  
13          from the panel in 9A a week ago, is that we have  
14          glyphosate formulated as Vision and we have glyphosate  
15          formulated as Rodeo, both used for forestry purposes,  
16          and Vision has the surfactant that we've been talking  
17          about in it, POEA, and as we've seen it has  
18          1,4-dioxane; Rodeo, on the basis of evidence on the  
19          record, does not have that surfactant, and the  
20          proposition I put to you is that, given the existence  
21          of these two formulations, one of which has a  
22          surfactant that has as a byproduct of some kind or an  
23          incidental contaminant a possible human carcinogen and  
24          the other product does not, does it not make sense as a  
25          prudent -- from a health standpoint to be prudent and



1 not permit the use of the product with the surfactant  
2 when you have an alternative available that does not  
3 have it?

4 A. I would still want to look at whether  
5 there was any significant risk created from its use. I  
6 may still decide in the end that you're right. If  
7 everything else is equal the risk might be small, but I  
8 still may want to do what you say, that's really a  
9 policy matter.

10 But I would certainly want to look and  
11 see whether any significant risk is associated with  
12 this, and this could be an extremely trivial risk, it  
13 might not be, I don't know. If it is, I wouldn't worry  
14 about it.

15 MADAM CHAIR: Mr. Castrilli, do we know  
16 that we don't have 1,4-dioxane in Rodeo?

17 MR. CASTRILLI: Madam Chair, last year we  
18 went through a series of articles, I believe I probably  
19 introduced them, that talked about tests involving  
20 glyphosate by itself as an active ingredient,  
21 glyphosate with Rodeo, and glyphosate with the  
22 surfactant in it which is known as Vision or Roundup,  
23 and it was clear from those studies themselves that the  
24 surfactant is in Vision and it is not in Rodeo and it's  
25 obviously not in the active ingredient, and we also



1           went through that exercise again last week with Panel  
2           9A.

3                   MADAM CHAIR: Yes. I don't -- could you  
4           provide me with the exhibit numbers when it's  
5           convenient.

6                   MR. CASTRILLI: Yes. Yes, I'd be pleased  
7           to.

8                   MADAM CHAIR: Thank you.

9                   DR. RACHMAN: Excuse me, Madam Chair--

10                  MADAM CHAIR: Yes, Dr. Rachman?

11                  DR. RACHMAN: --the question that Mr.  
12           Castrilli just put to Dr. Rodricks bears on something  
13           that I covered in my testimony yesterday.

14                  MR. FREIDIN: I'm sorry, I'm having  
15           difficulty hearing.

16                  DR. RACHMAN: The question that Mr.  
17           Castrilli just put to Dr. Rodricks has some bearing on  
18           a point that I made in my testimony yesterday and I  
19           would like to make a comment, if that would be all  
20           right.

21                  MADAM CHAIR: Please go ahead.

22                  MR. CASTRILLI: Yes. No, I have no  
23           objection.

24                  DR. RACHMAN: I mentioned in my evidence  
25           that inert ingredients that are used in products that

1 are to be applied to food crops are subject to the  
2 requirement for a tolerance in the United States, and  
3 that a tolerance either has to be granted or a specific  
4 exemption from that requirement must be granted, and  
5 that actively implies some form of review takes place.

6 Now, substances that have been granted  
7 exemption from such requirements are listed in the Code  
8 of U.S. -- the U.S. Code of Federal Regulations, Volume  
9 40 at Part 80.1001, and there is an entry in that  
10 section of the regulations that is for the chemicals  
11 polyoxyethylated primary amine, a chain length is  
12 given - I believe that's C14 to C18 - and there are  
13 some conditions put on this. This regulation applies  
14 to polyamine derived from an animal source containing 3  
15 per cent water and the average content of the  
16 polyoxyethylene averages 20 moles.

17 Now, I cannot tell you whether the  
18 surfactant in Roundup is part of this class of  
19 compound, but it may very well may be.

20 The point I'm trying to make is that that  
21 particular class of compounds has been cleared for use  
22 as a surfactant in products that are applied prior to  
23 planting of any crop, or as a directed spray around the  
24 base of any crop.

25 MR. CASTRILLI: Q. But, Dr. Rodricks, I

1 think the question I put to you was: If we have two  
2 products that do the same thing, one with a surfactant  
3 contaminated with a possible carcinogen and one  
4 without, what's the prudent health thing to do; use  
5 them both, or use the one that doesn't have the  
6 potentially problematic substance?

7 DR. RODRICKS: A. My approach, and I've  
8 been doing this my whole career, is to look at the  
9 possible extent of risk. If it really is very small  
10 and trivial I wouldn't worry about it, I wouldn't see  
11 any problem in using them both; if it were perhaps a  
12 borderline case or clearly if it was not insignificant,  
13 then I surely would want to do something about the one  
14 with dioxane, but I would like to base my decision on  
15 some knowledge about that, some evidence that there's a  
16 potential health problem.

17 Q. And when we use the word inert to  
18 talk about that part of a pesticide formulation which  
19 is not supposed to be pesticidally active, can you  
20 confirm for me that an inert is not necessarily  
21 biologically or toxicologically inactive?

22 A. You mean could some inert ingredient  
23 be --

24 Q. Toxicologically or biologically  
25 active?

1 A. Yes.

2 Q. Thank you.

3 A. Inert in this context means only they  
4 have no pesticidal line to them.

5 Q. Which means you don't need the inert  
6 to get the effect that you want; isn't that right? I  
7 think I should be directing this to Dr. Rachman.

8 A. Dr. Rachman knows more about  
9 pesticides and their effectiveness than I do, but the  
10 inert is important in getting the pesticide to where it  
11 is needed to do its job. Maybe you can expand on that.

12 DR. RACHMAN: A. I think you're  
13 generally correct, Dr. Rodricks. The inert by itself  
14 would not have pesticidal activity, but it would be  
15 present because it's deemed to be necessary to support  
16 or otherwise extend the pesticidal activity of the  
17 active ingredient, that is why they are used.

18 Q. And if we have two products that have  
19 two inerts, one with a possible carcinogen and one  
20 without, is it your testimony that we should use both  
21 or should we be more prudent and use the one without  
22 the carcinogenic contaminant?

23 A. My answer would be precisely the same  
24 as Dr. Rodricks to that question, but the question you  
25 raise also suggests that there may be differences in

1 activity between the two formulations which may have  
2 other impacts that have to be considered in the  
3 decision.

4 If the surfactant is there, presumably  
5 it's there for some reason, it makes the product more  
6 effective according to the manufacturer, you would want  
7 to look at that too, I imagine.

8 Perhaps if you're using a product with  
9 that surfactant you can end up using less than if you  
10 were using the product without that surfactant, in  
11 which case you would be cutting down your exposure to  
12 the active ingredient.

13 Q. Well, you're speculating now.

14 A. Yes, I'm speculating.

15 Q. Do you know anything about  
16 glyphosate?

17 A. No, I do not. I'm giving you a  
18 purely, you know, theoretical argument.

19 Q. All right.

20 MR. CASTRILLI: Madam Chair, those are my  
21 questions.

22 MADAM CHAIR: Thank you, Mr. Castrilli.

23 Ms. Kleer?

24 MS. KLEER: Good afternoon, Madam Chair.  
25 Good afternoon, Panel. Good afternoon, Mr. Martel.



1 MADAM CHAIR: Was your estimate for  
2 cross-examination two hours, Ms. Kleer?

3 MS. KLEER: At the outside. I don't  
4 think it would be -- it's probably more like an hour  
5 and a half.

6 MADAM CHAIR: All right. Well, we'll go  
7 to 3:10 anyway before we break.

8 MS. KLEER: Okay.

9 CROSS-EXAMINATION BY MS. KLEER:

10 Q. All right. If we could turn to page  
11 5, Dr. Rachman, I'd like to ask a few questions,  
12 specifically with respect to aminocarb.

13 I wasn't here for your direct and I  
14 understand that you gave some comments, but I'll just  
15 ask a few questions and seek clarification.

16 DR. RACHMAN: A. Yes.

17 Q. When was aminocarb deregistered, or  
18 is it correct to say that it was deregistered?

19 A. Well, to the best of our knowledge it  
20 was voluntarily cancelled by the registrant, but we  
21 were unable to determine when that happened or the  
22 circumstances surrounding that action. There were no  
23 regulatory proceedings pending against the chemical.

24 Q. Has aminocarb ever gone through a  
25 re-evaluation?

1                   A. Not as far as we have been able to  
2 determine.

3                   Q. And when was it originally  
4 registered?

5                   A. I cannot answer that question for you  
6 at this time. I could find out for you, if you like.

7                   Q. Would it be terribly difficult?  
8 Actually, I'll be asking questions later that I may not  
9 need that information, so I'll deal with it later.

10                  A. I would have to contact EPA in order  
11 to find that out, but...

12                  Q. All right. Now, aminocarb was never  
13 registered for food or feed uses in the U.S.; is that  
14 correct?

15                  A. I think that's correct, yes.

16                  Q. So there would be no maximum residue  
17 limits or acceptable daily intake levels established  
18 for aminocarb; is that correct?

19                  A. I have a list of tolerances or  
20 maximum residue limits with me. I can consult that  
21 list and tell you if there are any still in effect.

22                  I cannot answer the question as to  
23 whether there ever were any, I don't know. And on  
24 reflecting I'm not sure whether aminocarb ever had any  
25 food uses. I don't believe we asked that question when

1 we did our search.

2 Q. Well, just for clarification then, on  
3 page 5 your statement was that:

4 "The active ingredient in these  
5 pesticides...", and referring to the list  
6 prior to that paragraph,

7 "...except fenitrothion and aminocarb  
8 have registrations in the U.S. for  
9 food/feed uses and food or feed crop  
10 tolerances."

11 So that would seem to indicate; would it  
12 not, that they were never, as far as you know, as far  
13 as your enquiry showed, aminocarb and fenitrothion were  
14 never registered for use on food or feed crops?

15 A. Well, I intended that sentence to be  
16 in the present tense.

17 Q. All right. At present then.

18 A. I'm sorry, at present...?

19 Q. At present, okay.

20 A. Yes.

21 Q. And you can't tell me at this point  
22 whether or not they ever were registered for food or  
23 feed uses?

24 A. No, I can't.

25 Q. Would that be terribly onerous to

1 find out?

2 A. Only in a sense that it would take  
3 some time to do so and I would have to be back in my  
4 office to be able to answer that question, but I could  
5 certainly do that.

6 MS. KLEER: Would it be acceptable to you  
7 if we could have an undertaking to have Dr. Rachman  
8 provide that information?

9 MR. CASSIDY: Can you just indicate what  
10 the nature of the information is again, so we have it  
11 straight for the record.

12 MS. KLEER: Just whether or not aminocarb  
13 and fenitrothion were ever registered for use on food  
14 or feed crops, and I guess a corollary of that would  
15 be; if so, what were the maximum residue limits for  
16 those two substances?

17 MR. CASSIDY: All right. Yes. That  
18 won't be possible, I don't think, to get that  
19 information overnight, but we will get to you as soon  
20 as we can.

21 DR. RACHMAN: Certainly not.

22 MS. KLEER: All right. I would accept  
23 that in writing.

24 MR. CASSIDY: Good. Thank you.

25 MS. KLEER: Q. My next question may

1 again, given what you've just said to me, may not be  
2 the correct question but I'll ask it anyways. In the  
3 United States have fenitrothion -- sorry, in the United  
4 States fenitrothion and aminocarb have not been  
5 evaluated with respect to the most extensive data  
6 requirements; is that a fair conclusion to draw from  
7 what you've stated there?

8 DR. RACHMAN: A. Not necessarily, and  
9 I'll explain why. This portion of my evidence was  
10 intended to be a general overview of the sorts of  
11 evidence that are, in general, required for products  
12 registered for these sorts of uses.

13 Now, for any individual chemical that is  
14 to be registered for end use pattern, the EPA may  
15 decide to go beyond the sort of average requirements  
16 for the group and impose additional requirements.

17 So in order to find out what actual  
18 standard of evidence was used for either of these  
19 registrations, we would have to go -- for fenitrothion,  
20 for example, we could look at the registration standard  
21 and that document has a complete listing of all the  
22 studies that are required to support the registration.  
23 Looking at that document would allow us to determine  
24 whether or not the studies required for that chemical  
25 were more like those required for a food use



1 registration or some other sort of registration.

2 Now, for aminocarb, since there is no  
3 registration standard, there is no readily available  
4 list of what studies were required for that  
5 registration, so I don't see any practical way of  
6 answering that question.

7 Q. But at one time it was registered for  
8 use in forestry, aminocarb was. So at one time was  
9 there not a registration standard available at one  
10 time?

11 A. Not necessarily. It depends on  
12 during what period of time the chemical was registered  
13 and where EPA was in developing registration standards  
14 during that time period.

15 The registration standard program is  
16 prioritized according to potential exposures, among  
17 other things, and so they're dealing first with  
18 chemicals that have wide-spread exposure, significant  
19 data gaps and a few other criteria that I mentioned  
20 yesterday.

21 Q. So just for clarification, you don't  
22 know now, given the information you've looked at at  
23 this point, whether or not aminocarb has a registration  
24 standard or --

25 A. I believe it does not.

1                   Q. It does not. And again I apologize,  
2 I wasn't here yesterday. What does that mean with  
3 respect to data gaps, if it has no registration  
4 standard; do you have any way of telling whether or not  
5 there were data gaps in its registration?

6                   A. I have no easy way of making that  
7 determination. What I would do would be to try to  
8 contact EPA and find out historically what the  
9 situation was, but because this material is no longer  
10 registered and no longer used, you know, there's no  
11 further concern about it.

12                  Q. Let me just ask a general question  
13 then. If you're dealing with a forestry -- a pesticide  
14 that is being registered only for forestry use, can you  
15 say with any level of certainty, generally speaking,  
16 that you would have less extensive data requirements  
17 for the forestry use pesticides?

18                  A. If you were to look at the data  
19 requirements that are set out at 40 CFR, Part 158 and  
20 you were simply to look at those charts and compare  
21 what's required for food use versus what's required for  
22 forestry use, the list of required studies is shorter  
23 for forestry.

24                  Q. All right. Then just to get a  
25 clarification of what the difference is, perhaps you

1 could explain to me, is it set out at 40 CFR?

2 A. Yes, it is.

3 Q. Do you have that available?

4 A. I have that with me, yes. I assume  
5 we're talking about toxicity data requirements?

6 Q. Yes, yes.

7 A. Okay. Those requirements are listed  
8 in the table that is 40 CFR, 158.340 and I'm reading  
9 from 40 CFR, this is the latest edition, last revised  
10 July 1st, 1989.

11 Q. Okay. Well, what I'm trying to get  
12 at is: Could you tell me what data requirements are  
13 not required for forestry use pesticide registrations  
14 as compared to when it's going to be used for food or  
15 feed crops?

16 A. Okay. This is going to be a little  
17 complicated, so bear with me.

18 As I explained yesterday, when you look  
19 at these tables there are several different kinds of  
20 designations. Where the letter R appears -- capital  
21 letter R, that means that that study is an absolute  
22 requirement for that type of registration, you must  
23 provide some sort of information to allow the agency to  
24 evaluate that particular effect of interest.

25 There is also a designation CR and that

1 means conditionally required. That means that that  
2 study is required under certain circumstances. There  
3 are some footnotes in this table that spell out some of  
4 the circumstances under which those conditional  
5 requirements actually become real requirements, okay,  
6 inviolate requirements.

7 It's my opinion, based on my experience,  
8 that those footnotes do not define the only time that  
9 that additional information is required. EPA can  
10 exercise some discretion on a chemical by chemical  
11 basis to ask for additional information of any kind,  
12 and that is very explicit in the law and regulations.

13 Now, having said that, I'm looking in the  
14 forestry column here and I think the easiest thing to  
15 do is - although this will be quite tedious - is just  
16 read it out, the list of studies and, if it would be  
17 more convenient, we can provide copies of this for the  
18 Board.

19 MADAM CHAIR: And these are lists of  
20 studies required for food products but not forestry  
21 uses?

22 DR. RACHMAN: Perhaps it would be  
23 easiest, Madam Chair, if I start by talking about the  
24 studies that are required for both, the ones that are  
25 common.

1 MADAM CHAIR: Did you want that  
2 information?

3 DR. RACHMAN: Do you want me to --

4 MS. KLEER: Well, really I'm just looking  
5 for --

6 DR. RACHMAN: You want me to focus on the  
7 others? Okay.

8 MR. CASSIDY: What others. These are the  
9 studies that are not required for forestry?

10 MADAM CHAIR: But are for food?

11 DR. RACHMAN: No, these -- no.

12 MS. KLEER: No.

13 MR. CASSIDY: Or the two that aren't used  
14 in food?

15 DR. RACHMAN: Because you cannot say  
16 that studies are not required for forestry, you can  
17 only say that they are conditionally required for  
18 forestry; whereas, for food use they are an absolute  
19 requirement.

20 MR. CASSIDY: Okay.

21 MS. KLEER: Q. All right. Then just one  
22 further question: Are all of the potentially  
23 conditionally required studies for a forestry  
24 pesticide, do they cover the whole gamit of possible  
25 studies that are available or that must be required for



1 a food crop?

2 DR. RACHMAN: A. Yes, there is complete  
3 overlap and just by way of further clarification, some  
4 of those studies are conditional for the food use as  
5 well. Okay.

6 Q. All right.

7 MR. CASSIDY: Well, that's real clear  
8 now.

9 DR. RACHMAN: Oh, this stuff is clear as  
10 mud.

11 MADAM CHAIR: Is this a long list, Dr.  
12 Rachman?

13 DR. RACHMAN: Yes, it is quite a long  
14 list.

15 MS. KLEER: Q. How long is long.

16 MADAM CHAIR: Would it be better for us  
17 to get xerox copies?

18 DR. RACHMAN: I think it would be much  
19 easier for you to understand. If you had a copy before  
20 you, I could walk you through it in a minute or two.

21 MADAM CHAIR: Would you like us to make  
22 arrangements and then --

23 MS. KLEER: We could do that after the  
24 break.

25 MADAM CHAIR: Does this interrupt your

1 questioning?

2 MS. KLEER: Well, I'll have to switch  
3 over to another line of questioning. How long would it  
4 take to get a copy?

5 MADAM CHAIR: If someone could get -  
6 thank you - Ms. Devaul, I think we could do it fairly  
7 quickly.

8 MS. KLEER: All right. Well, why don't I  
9 skip to my next -- I have a short section and then  
10 hopefully we can have that available for questioning.

11 MR. CASSIDY: If Mr. Dadds could be  
12 instructed to advise Ms. Devaul to provide enough  
13 copies for all the parties. Thank you.

14 MS. KLEER: Q. Okay. Dr. Rodricks, I  
15 have a few points of clarification with respect to  
16 various standards. For the purpose of hazard  
17 evaluation and dose response assessment for toxic  
18 effects, other than cancer, you've indicated that the  
19 hazard evaluation and dose response assessment involves  
20 identification of the no observed effect level; is that  
21 correct?

22 DR. RODRICKS: A. That's right.

23 Q. To estimate an acceptable daily  
24 intake level a safety factor is applied; is that  
25 correct, to the NOEL?

1 A. That's one approach, yes.

2 Q. What other approaches --

3 A. Well, to establish -- if you were  
4 going to establish an acceptable daily intake, that's  
5 the approach you would take, yes.

6 Q. All right. Just to understand the  
7 comparison, is the LD 50 or one-fifth LD 50 level used  
8 to assess cancer risk in any way? What is the LD50  
9 used for? I'm trying to understand the relationship  
10 between LD 50s and acceptable daily intake levels?

11 A. There isn't much relationship. The  
12 LD50 is the lethal dose for a chemical or lethal to  
13 half the population studied, it is usually determined  
14 because clearly we'd like to know that. It's  
15 applicable primarily in the instances of accidental  
16 exposures, that sort of thing.

17 Where people may get a single acute --  
18 single high level exposure you'd like to know something  
19 about the toxicity of agent. They're usually used for  
20 labelling materials for degree of hazard for  
21 transportation and that sort of thing. They are also  
22 used as the starting point for more extensive toxicity  
23 studies, they're used to determine doses to be used in  
24 studies of longer duration.

25 Q. All right. That's what I'm trying to

1 get at. Would you ever use an LD50 level to assess  
2 long-term toxicity; would that give you any information  
3 at all about long-term toxicity?

4 A. Well, there are several papers to  
5 suggest that if that's all you have, there are methods  
6 for, not telling you what type of long-term toxicity  
7 might occur but where an ADI might be. I can go into  
8 that in a little detail. You wouldn't ordinarily do  
9 this unless you had no choice, you had to make some  
10 decision.

11 Now, there's evidence where -- there are  
12 several studies where scientists have looked at the  
13 LD50 value for chemicals and then also looked at the  
14 results of chronic toxicity studies for the same  
15 chemicals, and if it turns out that in some fairly  
16 sizeable databases involving several hundred  
17 chemicals - this is just empirical now - that if you  
18 divide the LD50 by a factor of a hundred thousand you  
19 would cover ADIs for those same chemicals where you  
20 have both LD50 and chronic toxicity data in more than  
21 95 per cent of the cases; that is, you'd have a plus a  
22 hundred thousand fold safety factor, would probably be  
23 protective - that's strictly empirical - and you would  
24 only do that if someone said: You've got to establish  
25 a chronic -- some kind of chronic figure for this

1 chemical. So there is some evidence for that, but  
2 ordinarily you wouldn't rely upon it.

3 Q. All right. So if you had an LD50 say  
4 for a bear that was consuming wild berries --

5 A. A bear.

6 Q. A bear consuming wild berries and it  
7 had to consume "x" number of pounds of wild berries to  
8 reach its LD50, you wouldn't want to make any  
9 assessment -- any rigid assessment as to what the  
10 acceptable daily intake level would be for that bear;  
11 would you, based upon just your information that you  
12 have with respect to the lethal dose to kill 50 per  
13 cent of the bears eating that many berries?

14 A. If your goal was to protect the bear  
15 from any long-term effects of the chemical.

16 Q. Yes, you wouldn't use an LD50  
17 standard; would you?

18 MR. CASSIDY: We're dealing here with  
19 human health evidence and I don't know whether -- I  
20 understand Ms. Kleer intends to cross-examine Panel 9A  
21 next week which of course deals with wildlife evidence,  
22 so I'm not sure whether this is the proper panel for  
23 that particular question.

24 If it's a general question, fine, but if  
25 you're asking specifically with respect to a bear, I'm



1 not sure this is the proper panel for that.

2 MR. MARTEL: It leads to humans.

3 MS. KLEER: I'm not asking specifically  
4 with respect to a bear, I'm asking generally can you  
5 use that kind of evidence to assess long-term effects  
6 on any creature.

7 MR. CASSIDY: Okay.

8 DR. RODRICKS: Not with very much  
9 certainty. I really don't know very much about  
10 wildlife and effects on wildlife.

11 MR. MARTEL: What about people?

12 DR. RODRICKS: But with people the only  
13 answer I can give is the one I already gave; you  
14 wouldn't ordinarily do that. If for some reason you  
15 were forced to - I'm trying to imagine what that might  
16 be - a hundred thousand fold safety factor has been  
17 recommended in several published and unpublished  
18 evaluations, that's strictly empirical and, as I said,  
19 it's based on the fact that for several hundred  
20 chemicals where one has both kinds of data, the LD50  
21 and the real chronic toxicity data, one finds that in -  
22 as I recall the figure - more than 95 per cent of those  
23 cases a hundred thousand fold safety factor on an LD50  
24 would get you at or below the ADI established on the  
25 basis of chronic toxicity studies. I wouldn't trust

1 MS. KLEER: Q. It's a ballpark?

2 DR. RODRICKS: A. It's a ballpark, yes.

3 Q. All right.

4 A. I have no idea whether anything like  
5 that -- I have no experience with sort of the  
6 procedures for setting limits for wildlife, I really  
7 don't.

8 MS. KLEER: Do we have copies yet of that  
9 information?

10 MADAM CHAIR: No, we don't, Ms. Kleer.

11 MS. KLEER: We don't. Okay.

12 Q. All right. The next section is also  
13 quite short. Again, Dr. Rodricks, if we can turn to  
14 page 50 of your witness statement. I'm going to try  
15 and ask this in a short way, I had originally tried to  
16 go through the entire Section 2.3 for this, but perhaps  
17 you can answer my question generally.

18 The title of this Section 2.3 is the  
19 Evaluation of Existing Scientific Evidence Concerning  
20 the Possible Toxicity of the Pesticides Used in  
21 Forestry.

22 Would you agree that the evidence that  
23 you have summarized in this Section 2.3 of your paper  
24 is exclusively related to herbicides and does not  
25 include any evidence on insecticides?

1 DR. RODRICKS: A. That is correct.

2 Q. All right. So it would probably be  
3 more correct to have that title read herbicides used in  
4 forestry rather than pesticides?

5 A. It's phenoxy herbicides in fact.

6 Q. Okay, thank you. So is it fair to  
7 say that your witness statement contains no evidence  
8 with respect to potential human health risks associated  
9 with use of chemical insecticides; fenitrothion,  
10 aminocarb and carbaryl?

11 A. We evaluated the analysis done by  
12 Crump and by the MOE and it's restricted to, I guess,  
13 the four herbicides covered by Crump and one by the  
14 MOE, yes.

15 MR. CASSIDY: It's ready now.

16 MS. KLEER: All right. Perhaps I can at  
17 this point turn to this excerpt. I suggest we make it  
18 an exhibit.

19 MADAM CHAIR: That will be Exhibit 1255.

20 MS. KLEER: And perhaps we could just  
21 call it 40 CFR 158.340.

22 ---EXHIBIT NO. 1255: Excerpts from 40 CFR 158.340.

23 MADAM CHAIR: Yes.

24 MS. KLEER: Something catchy.

25 MADAM CHAIR: Thank you, Mr. Dadds.

1 MS. KLEER: Q. So it's the table  
2 entitled: Toxicology Data Requirements?

3 DR. RACHMAN: A. Yes, that's right, and  
4 these apply to chemical pesticides. There are  
5 different requirements for microbial pesticides, for  
6 example.

7 You will note that across the top there  
8 is the heading General Use Patterns, and the first  
9 column on the left under that section says Terrestrial  
10 Food Crop, and then six columns to the right there is a  
11 heading Forestry.

12 Q. So we're just looking -- we will be  
13 essentially comparing those two columns?

14 A. Comparing those two.

15 Q. All right.

16 A. Right. Let me tell you just a few  
17 things to get you oriented to the table. The kind of  
18 tests required are listed down the left-hand column,  
19 that's pretty apparent. Wherever you see brackets  
20 around an entry that means that that test is not only  
21 required for registration but it's also required for an  
22 experimental use permit; that is a permit that is  
23 necessary if the manufacturer wants to do large-scale  
24 field testing, that's more than 10 acres.

25 Q. All right. Perhaps the best way

1 would be to simply identify those studies for which an  
2 R appears in the food crop so that it's required.

3 A. Okay, and does not for forestry?

4 Q. That's right.

5 A. The first one is about halfway down,  
6 that's the 90-day feeding study, rodent and non-rodent.

7 Q. All right. Let me just stop you  
8 there for a moment. Would that type of information,  
9 just in the abstract, if you were to do some sort of  
10 human health risk assessment for a person who consumed  
11 a product that was sprayed with that substance, would  
12 you want to have that information to assess the human  
13 risk?

14 A. Before I answer that question could I  
15 direct your attention to the footnote--

16 Q. All right.

17 A. --in that column. You'll note that  
18 next to 90-day feeding studies there's a column that  
19 says notes, footnote 17 is on that row. If you turn to  
20 footnote 17 which is on page 117, it shows you the  
21 circumstances under which that conditional requirement  
22 becomes becomes a requirement.

23 And if I can see that, it says:

24 "Required if the intended uses of the  
25 pesticide product is expected to result



1 in human exposure to the product under  
2 the following conditions:

3 (i) human exposure is via the oral  
4 route,

5 (ii) expected human exposure is over a  
6 limited portion of the human lifespan,  
7 yet is significant in terms of frequency  
8 of exposure, magnitude of exposure and  
9 duration of exposure (for example,  
10 products requiring....), so and so.

11 But what I want to illustrate here is  
12 that there is some criteria that the agency uses to  
13 determine whether or not that should be a requirement.

14 Q. Let me just stop you again. I don't  
15 know if this is going to be possible - and you can tell  
16 me if it's too much - but it would be very helpful for  
17 our purposes to understand, with respect to  
18 fenitrothion and aminocarb, which are only registered  
19 for forestry, whether or not these tests have been done  
20 even though they are not required. Can we obtain that  
21 information?

22 A. Okay. I have with me, I think, the  
23 registration standard for fenitrothion and that's what  
24 we need to refer to. For aminocarb I'm afraid I cannot  
25 help you at this time. I would have to get additional

1 information which may not even be available. So would  
2 you like me to get that information?

3 Q. If I could do it for fenitrothion,  
4 that would be good, or however one says that word.  
5 Again, if it's short, we may want to put that in as an  
6 exhibit.

7 A. Let me see what I have here, first of  
8 all.

9 I would like to explain, Madam Chair,  
10 these registration standards are not easy to read and  
11 it requires some time and you have to sort of know your  
12 way around the document to be able to figure out what  
13 EPA is saying and why, and even then you're not always  
14 sure.

15 MADAM CHAIR: Do we need the xerox  
16 machine again, Dr. Rachman?

17 DR. RACHMAN: Well, we may, as soon as I  
18 find it.

19 MS. KLEER: Q. Do they have courses in  
20 how to read registration standards?

21 DR. RACHMAN: A. That is my job  
22 security, experience in that area. Fortunately they do  
23 not give such courses. Okay.

24 DR. RODRICKS: A. There is a toxicity  
25 summary. Does that help her?

1 DR. RACHMAN: A. Okay. Let me explain  
2 something further. The document that is referred to as  
3 the registration standard for a chemical - and this is  
4 the one for fenitrothion right here - is actually, this  
5 sort of summary document that EPA makes publicly  
6 available which summarizes its position with respect to  
7 individual data requirements and then the overall  
8 regulatory position with respect to each individual  
9 registered use.

10 Now, in order to find out the technical  
11 basis for the EPA's position with respect to any of  
12 these data requirements; in other words, to find out  
13 why something is designated a data gap, you have to dig  
14 further in this document. That's not always in here,  
15 although sometimes it is.

16 They are supposed to make publicly  
17 available the background documents, they're either  
18 called science support chapters or technical support  
19 documents, for each subject area. If you know how to  
20 ask for them you can sometimes get them. They're  
21 supposed to be publicly available.

22 What Dr. Rodricks is looking at here is  
23 the science support chapter or the technical support  
24 chapter for the toxicology data portion of the  
25 fenitrothion registration standard. What that document

1 contains is the agency's more detailed assessment of  
2 the toxicity of the chemical and what's good or bad  
3 about the various studies.

4 MR. MARTEL: We need a lawyer.

5 MR. CASSIDY: I never thought I'd hear  
6 you say that, Mr. Martel.

7 MR. MARTEL: I did it for your sake, Mr.  
8 Cassidy, to make you feel good.

9 DR. RACHMAN: Now, I'm afraid I have  
10 forgotten the question, Ms. Kleer.

11 MS. KLEER: Q. Okay. All I wanted to  
12 get was whether or not for fenitrothion those studies  
13 which are conditionally required for forestry use have  
14 actually been carried out for fenitrothion?

15 DR. RACHMAN: A. Okay. Now, to answer  
16 that question Dr. Rodricks and I have to collaborate  
17 because we have to put these two documents together.

18 Under the 90-day feeding study --

19 DR. RODRICKS: A. Why wouldn't this  
20 match that?

21 DR. RACHMAN: A. Well, you see, under  
22 the column that says: Does EPA have data, under the  
23 90-day feeding study EPA has written: No. That means  
24 there is a data gap under the 90-day study. Now, what  
25 we have to determine is whether that means there was no

1 90-day study or whether we had one of those situations  
2 where it's an older study that, you know, just doesn't  
3 meet current guidelines. Can you tell her.

4 DR. RODRICKS: A. Well, I'm sorry. If I  
5 read from what is called the Toxicology Chapter Support  
6 Document, among other things, it says available  
7 subchronic studies - and that's the 90-day study -  
8 oral, dermal and inhalation are adequate to assess the  
9 toxicity of - a different trade name here - Sumithion,  
10 but it is the same material, okay, by these routes.

11 Now, I don't know why that--

12 DR. RACHMAN: A. Well, that's very  
13 interesting.

14 DR. RODRICKS: A. --why that doesn't  
15 match.

16 DR. RACHMAN: A. Okay. Now, there is  
17 footnote that says -- there is an entry in the column  
18 that says: Must additional data be submitted, the  
19 entry is: Yes. Oh, okay.

20 Q. Can I ask one question? Is one  
21 document prior to the other, or are they --

22 DR. RACHMAN: A. The document that Dr.  
23 Rodricks has is the technical basis, it's the technical  
24 review of the database from which this document is  
25 prepared allegedly.



1                   Okay. The footnote here I think explains  
2           it.

3                   "EPA has required the submission of new a  
4           subchronic rodent study to determine the  
5           no effect level for plasma  
6           cholinesterase."

7                   Now, it says -- oh, wait a minute. Then  
8           they say:

9                   "An acceptable two-year chronic feeding  
10          dog study is available and supersedes the  
11          need for a subchronic dog study."

12                  DR. RODRICKS: A. That agrees with this.

13                  Q. But there are two animal studies  
14          required in the U.S.; isn't that right?

15                  DR. RODRICKS: A. Maybe if we say what  
16          the toxicology summary says.

17                  DR. RACHMAN: A. We might get further by  
18          looking at the science rather than the administrative  
19          document.

20                  DR. RODRICKS: A. It might be harder to  
21          figure out. Why I think that is, it's two pages.

22                  Q. Okay. I think we'll have this  
23          introduced as an exhibit afterwards, that would be  
24          helpful.

25                  A. There's a cover memo plus a two-page

1 summary and then it is accompanied by a longer review  
2 from the Toxicology Branch of EPA for each of these  
3 studies covered in the summary.

4 MS. KLEER: All right. I think we  
5 should --

6 MR. CASSIDY: Can I just take a look at  
7 that for a brief second.

8 MADAM CHAIR: Can you shed some light on  
9 this document, Mr. Cassidy?

10 MR. CASSIDY: No.

11 MS. KLEER: All right.

12 DR. RODRICKS: Let me just give a quick  
13 summary.

14 MS. KLEER: Q. If you could, that would  
15 be helpful.

16 DR. RODRICKS: A. The summary document  
17 says:

18 "Sumithion is a nonsystemic  
19 organophosphate insecticide and  
20 acaricide. It possesses low skin, and  
21 eye irritation to mammals. It has been  
22 shown not to be sensitizer.

23 Available acute oral and dermal data  
24 show that Sumithion is moderately  
25 toxic to mammals by these routes.

1                   Acute delayed neurotoxicity studies  
2                   in the hen with Sumithion showed negative  
3                   results at  
4                   doses of 500 mg/kg.

5                   Available subchronic studies (oral,  
6                   dermal and inhalation) or adequate to  
7                   assess the toxicity of Sumithion by these  
8                   routes."

9                   Then they discuss a chronic feeding study  
10                  with Sumithion in the rat and some results. Maybe I'll  
11                  skip the results, but there was such a study. I think  
12                  the question is what studies have been done.

13                  Then they note:

14                  "An oncogenic study in the mouse show  
15                  that Sumithion was not oncogenic at a  
16                  concentration of 200 ppm...however,  
17                  because of design deficiencies, the  
18                  study is now considered supplementary."

19                  Q. Could you clarify what that means?

20                  A. I think Dr. Rachman will have to  
21                  describe supplementary. And then:

22                  "Chronic toxicity studies in the dog with  
23                  Sumithion have been accepted."

24                  MADAM CHAIR: So are we saying with what  
25                  you've just read, Dr. Rodricks, that this table, where

1 it indicates that something might -- that a study might  
2 be required that it's CR and not R, in fact those  
3 studies have been done anyway?

4 DR. RACHMAN: Yes, that's right.

5 MADAM CHAIR: And they've been done  
6 because a registrant wanted to do them, not because  
7 they were required by EPA?

8 DR. RACHMAN: I can't answer that  
9 question, but for whatever reason that information is  
10 available in the database and since it's there the EPA  
11 has evaluated that information according to current  
12 standards and where the tests don't measure up they're  
13 asking for those studies to be repeated.

14 DR. RODRICKS: Yes. There is second page  
15 here, Madam Chair, that refers to some other tests,  
16 teratology and reproductive studies appear to have been  
17 done, but they were judged not to be adequate for  
18 reasons not stated here.

19 So there seems to be quite an extensive  
20 battery of tests, some of which they have judged  
21 adequate and others not.

22 MS. KLEER: Q. And what's the date of  
23 that memo?

24 DR. RODRICKS: A. This memo is May 8th,  
25 1987.

1 Q. And is that, to your knowledge, the  
2 most current memo?

3 DR. RACHMAN: A. To our knowledge it is,  
4 it's the most current publicly available document.

5 MS. KLEER: Perhaps we could make that  
6 first summary document the next exhibit, Madam Chair.

7 MADAM CHAIR: Exhibit 1256.

8 ---EXHIBIT NO. 1256: Three-page memorandum entitled:  
9 Sumithion, Toxicology Chapter of  
10 the Registration Standard,  
dated May 8, 1987, authored by  
EPA.

11 MS. KLEER: And I'm not certain we can  
12 get copies available for the Board. How do you want  
13 this done?

14 MADAM CHAIR: Mr. Dadds. Thank you very  
15 much.

16 DR. RACHMAN: Madam Chair, would you like  
17 me to clarify the meaning of supplemental study status?

18 MS. KLEER: Q. Yes, please, if you could  
19 do that.

20 DR. RACHMAN: A. The EPA uses that  
21 category for a study that contains usable valid  
22 scientific information but which does not completely  
23 measure up to the current protocols in the guidelines.

24 MADAM CHAIR: Dr. Rodricks, is it the  
25 three-page document we're making an exhibit?



1 MS. KLEER: I would like to make the  
2 three-page document -- now, we haven't referred to the  
3 other one, but I understand that that is an elaboration  
4 upon what's in the summary.

5 DR. RODRICKS: Is that correct, Dr.  
6 Rachman. It looks like that.

7 DR. RACHMAN: My understanding --

8 DR. RODRICKS: I have never seen this  
9 document before today. It looks like that.

10 DR. RACHMAN: This came to us from EPA as  
11 an excerpt from the file, the fenitrothion registration  
12 standard file. It has no title on it, no attribution  
13 of any kind.

14 Based on my experience, I think what this  
15 is is the Toxicology Branch review of all the studies,  
16 and I have written that up here in the corner. We  
17 proceeded as though that was the case, and I think it  
18 is the case. That's what it says.

19 MS. KLEER: Well, I think for greater  
20 completeness we should have both of those and we could  
21 introduce them as one exhibit. I think that would be  
22 satisfactory.

23 MADAM CHAIR: You accept Dr. Rachman's  
24 title for the second document?

25 MS. KLEER: I'll accept that.

1 DR. RODRICKS: There is more evidence  
2 that that is what this is. The cover memo -- the EPA  
3 cover memo refers to a toxicology profile attachment,  
4 21 pages and --

5 DR. RODRICKS: Sorry, this is 22 pages.

6 MADAM CHAIR: 22 pages. We won't get  
7 copies made immediately. Do you need to look at that  
8 right now, Ms. Kleer?

9 MS. KLEER: No, I'm satisfied with what  
10 we have done so far up to now.

11 MADAM CHAIR: Why don't we get Mr. Dadds  
12 to ask that copies be made for everyone of those two  
13 documents but we don't need them until after the break.

14 Thank you.

15 MR. CASSIDY: So that second document is  
16 going to be marked?

17 MADAM CHAIR: It's going to Exhibit 1257,  
18 it's 22 pages, the first one is three pages.

19 ---EXHIBIT NO. 1257: Document entitled: Toxicology  
20 Profile authored by EPA.

21 MS. KLEER: Q. And just for clarity on  
22 the record, the document that you were referring to was  
23 Exhibit 1256, Dr. Rodricks, the three-page summary?

24 DR. RODRICKS: A. The one that I read  
25 from was the three-page summary.

1 Q. All right.

2 A. Yes.

3 Q. All right, thank you.

4 MR. MARTEL: Can I just ask one question.  
5 The last part of the explanation of supplemental,  
6 usable -- I just didn't get it.

7 DR. RACHMAN: I'm sorry. EPA uses that  
8 classification when a study contains usable  
9 scientifically valid information that it will consider,  
10 you know, in its overall review but the study in and of  
11 itself does not meet the requirements of the protocols  
12 in the guidelines that I talked about yesterday.

13 MADAM CHAIR: Okay. Why don't we get Dr.  
14 Rachman to just give us the titles of those documents  
15 again so we'll have -- I don't have down the exact  
16 titles. Let's do it when we get the copies back.

17 MS. KLEER: All right.

18 MADAM CHAIR: I do not have the titles of  
19 the documents.

20 MS. KLEER: Q. All right. Let me ask --  
21 I'm not certain that I asked this but I'll ask it again  
22 just to be sure.

23 At the present time are there food or  
24 feed crop tolerances for fenitrothion or aminocarb?

25 DR. RACHMAN: A. If you would just give

1 me a moment, I'd like to check that.

2 DR. RODRICKS: A. While Dr. Rachman is  
3 looking, I might note in the data requirements  
4 specified here, in addition to the toxicology data,  
5 there are many studies required concerning the  
6 environmental fate of the material.

7 Q. All right. I was more concerned with  
8 the human health side of it for the moment.

9 A. But none seem to pertain to food  
10 crops, they seem to be more strictly environmental, but  
11 you ought to check that.

12 DR. RACHMAN: A. Unless these two  
13 chemicals have other names that I'm just not familiar  
14 with, neither one is listed on this list which is  
15 everything that currently has food crop tolerances.

16 Q. You may not be able to answer this,  
17 but are you aware as to whether or not fenitrothion or  
18 aminocarb are registered for food uses in Canada?

19 A. I cannot answer that.

20 Q. All right. Would you be able to  
21 comment generically with respect to pesticides that are  
22 used in forestry only, or at least in forestry, they  
23 may also be used for something else, are the Canadian  
24 data requirements for registration less extensive or  
25 more extensive or similar to the U.S. EPA requirements,

1 and I should direct that specifically to fenitrothion,  
2 aminocarb and carbaryl.

3 A. I really have no knowledge of what  
4 the data requirements are in Canada for all those  
5 chemicals.

6 Q. Now, Dr. Rodricks, you identified a  
7 number of types of studies which the U.S. EPA has  
8 specified for fenitrothion as not currently being  
9 available; is that correct?

10 In other words, there are studies that  
11 have yet to be done in order to satisfy the U.S. EPA;  
12 is that correct?

13 DR. RODRICKS: A. Well, yes --

14 DR. RACHMAN: A. We have given that  
15 document away to be --

16 DR. RODRICKS: A. The first question  
17 was, are there more than -- were some of these studies  
18 marked in Exhibit 1255 as CRs, as conditionally  
19 required, are there such data on fenitrothion, and  
20 there apparently are quite a number of studies, some  
21 judged to be adequate by current standards and others  
22 not adequate.

23 Q. All right. The fact that some of  
24 those studies are not considered to be adequate, does  
25 that cause -- would that cause you concern were you to



1 carry out a human health risk assessment for people who  
2 were eating substances exposed to the fenitrothion in  
3 this case?

4 A. Well, it would depend on the reason  
5 for their inadequacy. Dr. Rachman, maybe you need to  
6 go through again this issue of adequacy in the data  
7 gaps because there were several kinds of reasons, some  
8 of which are important from a health point of view and  
9 others which are not very important.

10 So I'd have to understand what the basis  
11 for the so-called data gap or inadequacy was.

12 Q. Well, let's assume, and we can only  
13 assume in the abstract, that the data gap were related  
14 to human health considerations.

15 A. I was talking about the nature of the  
16 data gap.

17 MADAM CHAIR: You mean to say there is no  
18 data, Ms. Kleer?

19 MS. KLEER: No, I'm not saying that at  
20 all. All I'm trying to determine is what --

21 Q. Would there be any concern with a  
22 data gap if it were identified as one that pertained to  
23 human health effects and there was such a data gap,  
24 would you then be able to assess that substance in  
25 terms of the human health risk assessment?

1 DR. RODRICKS: A. Maybe Dr. Rachman  
2 could go a bit again through some of the reasons why  
3 data gaps might exist.

4 DR. RACHMAN: A. Right.

5 DR. RODRICKS: A. Some reasons have a  
6 perhaps important effect -- raise an important  
7 uncertainty about human health and others do not, they  
8 really pertain more to issues of the reporting  
9 requirements and so on. Maybe, Nancy, you can expand  
10 on that a bit.

11 DR. RACHMAN: A. I talked yesterday  
12 about the kinds of requirements that EPA places on  
13 studies that are done for registration. There are the  
14 pesticides assessment guidelines which contain the  
15 requirements for protocol, how the study is supposed to  
16 be designed and performed.

17 There are also requirements that apply to  
18 how the study is reported, how the report is written,  
19 what sections are in it, the order and so on. There  
20 are also regulations called good laboratory practices  
21 which determine various activities in conjunction with  
22 the running of a study, for example, how the records  
23 are kept, how the samples are handled and so on.

24 If a study fails to meet any of these  
25 criteria that data requirement is designated to have a

1 data gap. Now, it's very important that you understand  
2 that failure to meet any of those criteria for the  
3 guidelines does not mean that the study is  
4 scientifically invalid, it doesn't mean that the  
5 information in it is no good, it simply means that the  
6 administrative requirements placed by the agency have  
7 not been meet.

8 Now, just looking at one of these  
9 registration standard documents you can't always tell  
10 whether you're facing a situation like that with a  
11 particular data gap or whether in fact there's no  
12 information in the file to cover that particular data  
13 requirement. Now, that would be the situation where  
14 you would have some concern. If there was no usable  
15 information at all to support your assessment, that  
16 could be more serious potentially.

17 Q. And just for clarity then on the  
18 record -- on the face of the registration standard  
19 itself you would not be able to tell whether or not the  
20 data gap was one that was an administrative one or a  
21 human health effect one?

22 A. Yeah, you may not, you'd have to do a  
23 little digging into some of the background documents  
24 probably to be able to figure that out.

25 Q. All right, thank you.

1                   In the absence of information on a  
2                   maximum residue limit or on a food crop tolerance,  
3                   would you feel comfortable in making a human health  
4                   risk assessment for a person who consumed that crop  
5                   even though there was no maximum residue limit or  
6                   tolerance level established in the literature?

7                   A. I think I'd defer Dr. Rodricks to  
8                   answer that question. But essentially I think what you  
9                   would do would be to go through the same sort of  
10                  process that EPA would go through in setting the  
11                  tolerance.

12                 The fact that no tolerance exists does  
13                 not imply that EPA refused to grant one, it can just as  
14                 likely imply that the registrant never intended this  
15                 material to be used on food crops for one reason or  
16                 another, there was no market or whatever. So, you  
17                 know, there is no tolerance, but you could come up with  
18                 a tolerance using the available data, you could go  
19                 through that exercise.

20                 Q. So then is it fair to say that the  
21                 mere fact that you don't have a tolerance level doesn't  
22                 make it impossible for you to do a risk assessment, a  
23                 human healthy risk assessment?

24                 A. That's right, that's right. The  
25                 setting of a tolerance involves reviewing the toxicity

1 data to determine the acceptable daily intake and then  
2 getting some idea of what the residue levels that the  
3 person is likely to be exposed to might be.

4 If you're talking about a food crop  
5 tolerance, you would be testing material at the maximum  
6 allowable label rates to see what the maximum residues  
7 might ever be on crops and you would compare that to  
8 the toxicity data. So you would go through the same,  
9 could go through the same sort of exercise.

10 Q. In your opinion from a risk manager's  
11 perspective, would you want to have available to you as  
12 a standard a maximum residue limit or a food tolerance  
13 for a substance which didn't have one but nonetheless  
14 appeared on food crops that were consumed by a  
15 particular part of the population?

16 A. I'm not sure I would have to take the  
17 sort of administrative step of setting a legal residue  
18 limit, I would probably want to know that the residues  
19 that people were likely to encounter in the environment  
20 fell within the acceptable daily intake levels and that  
21 that would maybe be doing some sort of comparison  
22 between environmental concentrations and the toxicology  
23 information.

24 Q. Do you have anything to add to that?

25 DR. RODRICKS: A. No, are you getting at



1 possible -- tolerances are set where there's an  
2 expectation - food tolerances are set where there is an  
3 expectation of regulation application to food crops, so  
4 that there's going to be some potential for a  
5 continuing exposure through the food supply.

6 Q. Well, what I'm --

7 A. You have to have a tolerance either  
8 way under those circumstances. Now, you're talking  
9 about --

10 Q. Something that inadvertently--

11 A. Inadvertent sort of situation.

12 Q. --gets sprayed even though it's not  
13 the intended crop to be sprayed, it's not the intended  
14 substrate, if you will, to be sprayed; for instance,  
15 berries in the forest. That is primarily what I'm  
16 trying to get at.

17 Would you agree though that it would  
18 make -- it would make a risk manager's job more easy if  
19 they had a maximum residue limit available for that  
20 particular food that was again not intended to be  
21 sprayed but was in fact sprayed in the course of a  
22 forest spray operation?

23 A. There are a couple of ways to  
24 approach that, at least EPA in looking at forest use  
25 for pesticides would look at. I mean, they have got

1 studies where you look at residues that might occur in  
2 the environment and they may not set a tolerance but  
3 they've have to be assured that there was an adequate  
4 safety margin for those kinds of incidental exposures,  
5 and that would be part of their review process. That's  
6 the reason for collecting all of this toxicity data,  
7 they would look at -- the footnote that Dr. Rachman  
8 read says that this information that they are setting  
9 forth here, all these studies on the environmental fate  
10 in water, on soil, on plants and so forth, the purpose  
11 of that is to see whether any significant risk is  
12 created under the normal use of this within forests.

13 Now, the purpose of setting a tolerance  
14 would be something where you do that because you need  
15 some kind of legal enforcement advice there where  
16 someone, you know, there's monitoring in the food  
17 supply and you use that as a way to check whether  
18 compliance with approved application rates is being  
19 adhered to.

20 I wouldn't imagine the tolerance has much  
21 use in, let's say for a wild crop, but there ought to  
22 be, and I think there is in the EPA process an  
23 evaluation of the risks from that sort of use even  
24 though it doesn't end up as a formal tolerance.

25 Q. Well, would it also be true that it

1 wouldn't end up as a formal acceptable daily intake?

2 A. The acceptable daily intake is  
3 derived from the toxicity data. The evaluation of the  
4 fate of the pesticide in the forest, how much might get  
5 into I guess berries or fish or whatever gives you  
6 information on the exposures that could result from  
7 these kinds of applications, and also the size of the  
8 exposure as well as how often it might occur, let's  
9 say, in an individual's lifetime, and they would do an  
10 evaluation of the risks, if there was evidence of  
11 deposition in food, before allowing the use of the  
12 material in the forest situation. That is what EPA  
13 would do.

14 DR. RACHMAN: A. Maybe I could just  
15 clarify one other thing. An acceptable daily intake is  
16 calculated even if there is no food use proposed. They  
17 use the word intake really to mean dose.

18 Q. Right.

19 A. So irregardless of the route of  
20 exposure, the EPA calculates what the acceptable dose  
21 is and compares that with the toxicity data.

22 DR. RODRICKS: A. With exposure.

23 DR. RACHMAN: A. I'm sorry, with the  
24 exposure data, thank you.

25 Q. Now, I know you can speak only to the

1 U.S. In the course of the forest pesticide  
2 registration, is consideration given to the potential  
3 for people living -- eating products, food products  
4 that are found on the land, is that potential  
5 considered in the course of deciding whether or not it  
6 should be registered; and, if so, how? Again, we'll  
7 use the wild berry consumption as an example.

8 A. I'm not aware of whether or not that  
9 specific scenario is evaluated with respect to forestry  
10 uses. Based on what I know of the EPA process, I would  
11 expect that what would happen is they would evaluate  
12 the exposure of the most highly exposed people in the  
13 forestry situation. That would be applicators, mixers,  
14 loaders and so on.

15 If the margin of safety was low for those  
16 people, they would probably go on and do a much more  
17 detailed analysis of different kinds of exposures,  
18 different kinds of exposed groups. If, however, the  
19 margin of safety for the most highly exposed group is  
20 high, then they would just say, I think, everybody  
21 else's exposure is going to be much lower than this,  
22 it's not going to be a problem.

23 Q. Do you see any difficulty with making  
24 that assumption; i.e., that a margin of safety if  
25 low -- or sorry, if high for an applicator means that



1 the margin of safety for anybody else is going to be  
2 even higher than that for the applicator?

3 Is there any problem with that if you  
4 consider people who live off the land by consuming  
5 foods off the land, wild berries, wild meat, wild fish,  
6 drinking water that is exposed to a spray --  
7 potentially exposed to a spray?

8 DR. RODRICKS: A. The only basis I have  
9 for judging that, the only thorough sort of  
10 quantitative analysis I have seen - I haven't seen  
11 anything within EPA's files on the topic - but the  
12 Crump analysis does just that, it looks at exposures to  
13 people who are involved in the application as well as  
14 exposures to bystanders, the general population, and  
15 considers exposures from drinking water, from fish,  
16 from wild berries, from direct contact, skin contact  
17 with foliage that has been treated - and I must have  
18 missed something - I guess inhalation of any volatile  
19 material as well.

20 And pretty consistently throughout that  
21 analysis the occupational exposure stands out as the  
22 high risk situation, but that's true in most other  
23 pesticide situations that I'm familiar with, where you  
24 compare food crop intakes, for example, with  
25 occupational exposures, the exposures tend to be in



1 most cases considerably higher for those who are  
2 involved in the manufacture or the mixing or  
3 application.

4 Now, if you're going to ask me to  
5 generalize whether that is always true, I'm not sure.  
6 I don't know of any evidence that it wouldn't always be  
7 true.

8 Q. Well, let me just ask you on the  
9 other side then, are you aware of any similar type of  
10 risk assessments for fenitrothion, aminocarb and  
11 carbaryl?

12 A. I am not, no.

13 Q. Would you be aware of that, if it  
14 existed, Dr. Rodricks, as part of your job? Should you  
15 be aware of that? Would you expect to run across that  
16 sort of information in the course of your work?

17 A. I see a lot of assessments done in a  
18 lot of different contexts. I don't know, I really  
19 don't know.

20 MR. MARTEL: How would they establish the  
21 standards then for the example that people working with  
22 Caesar Chavez -- the people Caesar Chavez has always  
23 been fighting for, they're setting standards there and  
24 that's based on frequency of exposure as opposed to  
25 people who are consuming food; there is a difference?

1 DR. RODRICKS: Yes. The general  
2 procedure I can describe, that in the -- the EPA has  
3 some toxicity requirements that are very specifically  
4 directed to the occupational exposure situation because  
5 they are not likely to occur to others, the general  
6 population, splashing of the -- they have tests for the  
7 effects, for example, of splashing in the eye or on the  
8 skin or even inhalation because in most cases --  
9 perhaps not in the forestry situation, but in most  
10 cases those routes of exposure will occur only in  
11 people who are in the manufacture or application  
12 business. So they have those types of performance.

13 In addition, the EPA will evaluate the  
14 exposures. The manufacturer is required to provide  
15 information on the exposures that workers will  
16 experience both in terms of the size of the exposure as  
17 well as the frequency of it. People in manufacture  
18 could be exposed over a large part of their lifetime;  
19 people in the application business will have less  
20 frequent exposure. And, in addition to the exposure  
21 information required for, let's say, the food  
22 application of the pesticide, there are a lot of -- the  
23 manufacturer, in addition to all these toxicity  
24 studies, has to supply all that information to EPA.  
25 There are lots of other requirements besides toxicity

1 tests.

2 The EPA then will evaluate exposures and  
3 it has to ensure itself that there will be adequate  
4 protection for workers as well as for the general  
5 public.

6 There are some differences in the  
7 standards applied. Generally the safety margins are  
8 smaller for workers than for the general public. That  
9 is true not only for pesticides but for all kinds of  
10 chemicals, there are reasons for that, but the EPA has  
11 to make a determination before they register a  
12 pesticide that there is not going to be harm to workers  
13 or to the public, and they do that by looking at  
14 exposure versus toxicity.

15 And part of the way to control then the  
16 exposures is to establish tolerances which are a way  
17 the government then has to check on whether the actual  
18 use complies with what -- complies with the  
19 requirements. There are also requirements for worker  
20 monitoring, so on and so forth, to check whether  
21 there's proper use of the material.

22 DR. RACHMAN: A. And re-entry intervals  
23 are another one that's important for protecting more  
24 lives.

25 DR. RODRICKS: A. Re-entry intervals are

1 important. Now, they do not establish tolerances for I  
2 guess basically wild crops, and I have not seen formal  
3 analyses, but they would have to be assured that those  
4 kinds of uses are not going to harm individuals who may  
5 be taking such crops.

6 I think Nancy is right, that if primary  
7 first evaluation is with the workers who are out there  
8 because they are expected to experience the highest  
9 exposures. I think that may be a pretty widely  
10 accepted premise. If there's quite a wide margin of  
11 safety there they might assume that there's no problem  
12 otherwise.

13 I'm not sure at that point how formal the  
14 analysis is of berries or fish or whatever in the  
15 environment.

16 Q. All right. With respect to that  
17 assumption then again, are either of you aware of any  
18 study that has actually tested that question in the  
19 context of a population, whether it be in Australia,  
20 aboriginal people in Australia or any aboriginal  
21 peoples in any country that would compare those two?

22 A. I'm not aware of any formal study  
23 outside the Crump analysis.

24 Q. But the Crump analysis doesn't deal  
25 with aboriginal peoples; is that fair to say?



1                   A. Well, it does deal with people who  
2 will get some of their food from those sources that  
3 might be treated with forestry herbicides.

4                   Q. Does the Crump analysis address the  
5 question of cumulative risk impacts -- sorry,  
6 cumulative risk for people who consume or receive these  
7 various doses of 2,4-D, glyphosate and the other  
8 substances?

9                   A. Yes, it does. Their primary analysis  
10 looks at the risks associated with a single spray  
11 application and they sort of present some risks for  
12 both workers - and they call it the general population,  
13 that could be anything, anybody not a worker.

14                   They then have -- in a section toward the  
15 rear of their report they note that the frequency with  
16 which particular areas in the forest would be treated,  
17 and then they devise -- they note that there could be  
18 many possible ways people might come in contact with  
19 those treated areas immediately after treatment,  
20 although they say three times in a lifetime is about  
21 the maximum expected, but there might be several ways.

22                   And then they just give some -- there are  
23 many possible sets of assumptions you could employ to  
24 estimate exposure resulting from those treatments.  
25 They give three or four examples of such. So they do



1 look at the cumulative impact. What they say is  
2 something like a worst case situation.

3 Q. Do they do that specifically for  
4 certain types of bystanders who would be exposed?

5 A. We could look specifically at the  
6 scenarios they propose.

7 Q. If we could do that.

8 MS. KLEER: I don't know if the Board has  
9 a copy of the full Crump report before it. I know that  
10 there was some discussion about that.

11 MADAM CHAIR: What is the exhibit number  
12 for Crump?

13 MR. CASSIDY: It's Exhibit 716, Madam  
14 Chair.

15 MADAM CHAIR: Ms. Kleer, I think we are  
16 going to take our break now.

17 MS. KLEER: All right.

18 MADAM CHAIR: And come back and look at  
19 the Crump report. Let's see what we have.

20 MS. KLEER: Perhaps just before we break  
21 if I can --

22 MADAM CHAIR: 716?

23 MS. KLEER: Yes, it's 716, but I'm not  
24 certain whether 716 is the entire Crump report or  
25 whether it's an excerpt.

1 MADAM CHAIR: It's not. We have got an  
2 excerpt of pages 109 -- well, they're all over.

3 MR. CASTRILLI: Madam Chair, my  
4 understanding is I have an entire copy of the Crump  
5 report, and what was done last year was that Ms. Cronk  
6 worked with what she had described as an excerpt, which  
7 I believe most of us were given at that time, and at  
8 the close of her cross-examination or indeed perhaps  
9 the closing a particular panel, she filed the entirety  
10 of the document.

11 It's a document approximately 350 pages  
12 and I believe that was made Exhibit 716 and the excerpt  
13 that she had been working with during cross-examination  
14 became Exhibit 716A.

15 MADAM CHAIR: Do you need a copy of the  
16 full report, Ms. Kleer?

17 MS. KLEER: I would like to have a copy  
18 but I'm afraid Dr. Rodricks will also have to look at  
19 it.

20 DR. RODRICKS: I have a copy here.

21 MADAM CHAIR: He has his copy.

22 MS. KLEER: You do have a copy.

23 So if I could look at --

24 MADAM CHAIR: Approach Ms. Devaul at the  
25 break and you can use ours.

1 MS. KLEER: I'll do that.

2 ---Recess taken at 3:07 p.m.

3 ---On resuming at 3:40 p.m.

4 MADAM CHAIR: Please be seated.

5 MS. KLEER: Okay. I just have a few  
6 remaining questions. I will ask my question on the  
7 Crump reported at the end.

8 Q. Again just to clarify, Dr. Rodricks,  
9 to your knowledge does the existing U.S. EPA  
10 registration process for pesticides include doing a  
11 specific human health risk assessment for native people  
12 living off the land if it can be expected that native  
13 people would be exposed?

14 DR. RODRICKS: A. A very specific  
15 question like that, I don't know, no.

16 Q. You don't know.

17 a. I do know that they will consider the  
18 pathways of possible human exposure from the use of  
19 materials in the forests, but exactly what form the  
20 overall assessment takes, I do not know.

21 Q. Would it be necessary for them to do  
22 an exposure assessment for the native people in order  
23 to complete that human health risk assessment?

24 A. Would it be necessary?

25 Q. Well, it's true; is it not --

1                   A. They would have some information on  
2 the level of residues on plants and that would include  
3 the edible part of plants after an application.

4                   Q. But they would need to know; wouldn't  
5 they, how much plant - whatever that plant was - was  
6 being consumed in order to do a proper risk assessment?

7                   A. Know or make some kind of worse case  
8 assumption about it, yes.

9                   Q. Okay.

10                  A. But I have never seen an analysis of  
11 that type from EPA.

12                  Q. Okay. Dr. Rachman, would you have  
13 come across that or would it be possible to have seen  
14 that?

15                  DR. RACHMAN: A. I just can't recall if  
16 I have ever seen anything like that, Ms. Kleer.

17                  Q. All right. Would the existing  
18 information, the existing scientific information allow  
19 you to assess human risk to native people who obtain  
20 the majority of their diet from wild food?

21                  DR. RODRICKS: A. I think you could do  
22 that, I guess I'm not sure whether the Crump analysis  
23 would cover that. I don't know enough about that  
24 activity.

25                  The Crump analysis does deal with the

1 public -- some segment of the public that takes a share  
2 of its food from areas that are treated with  
3 herbicides, and we were going to go through a little  
4 bit to show what they have done in that regard. There  
5 are a large number of possible ways one could imagine  
6 people might come in contact with the herbicides or  
7 consume foods with them. They show several examples  
8 and I don't know whether that would match, you know,  
9 every possible pathway, it would be representative.

10 Q. Why don't you set out those examples  
11 that they set out so that we can deal with that.

12 A. Yes. They are discussed on page 313  
13 of the Crump report.

14 Q. And perhaps if you could just  
15 summarize for the Board.

16 A. Yes. This follows a section where  
17 they did the same thing for occupational exposures,  
18 they looked at workers who might be exposed in the  
19 State of Washington.

20 Q. And just for the sake of the record,  
21 Section -- or page 313 starts Section 11.4.2 which is  
22 entitled Lifetime Exposure to the Public.

23 A. That's correct. Maybe I can just, to  
24 make it easier, read a couple of the key points from  
25 their discussion. They say that:



1 "Persons who live adjacent to sprayed  
2 forests or who frequent these forests may  
3 be exposed to herbicides several times in  
4 their lifetime."

5 Then they note a little further on that:

6 "At least in the State of Washington the  
7 Department of Natural Resources refers to  
8 the fact that an average of two aerial  
9 sprays during a harvest rotation of 64  
10 years is what occurs."

11 So Crump then concludes that:

12 "Over a full lifetime, if you were living  
13 there a full lifetime that there might --  
14 there would be three spray events during  
15 that lifetime and you could then acquire  
16 some exposure from each one of those  
17 spray events."

18 They then refer back to earlier  
19 discussions where they look at each of the herbicides  
20 and all of the pathways of exposure for each and  
21 select -- they point out that there are many possible  
22 combinations of exposure that one could look at. They  
23 select three which they think to be either  
24 representative or something like a worst case.

25 The three they selected to illustrate

1 this cumulative exposure are presented on page 315 and  
2 they are called scenarios.

3 "Assume that an individual....", Scenario  
4 1:

5 "Assume that an individual lives adjacent  
6 to one spray area and is exposed to  
7 herbicide 2,4-D at age 1, glyphosate at  
8 age 10, phosamine as an adult...", now,  
9 only two of those are relevant in your situation,

10 "...and assume that at age 1 the  
11 individual is exposed by dermal and  
12 inhalation routes, at age 10 by dermal  
13 and inhalation routes and by ingestion of  
14 water, fish and berries, as an adult by  
15 dermal and inhalation routes and by  
16 ingestion of deer meat and vegetables..."

17 So they put in these various combinations  
18 and I say you could do this many different ways. With  
19 the data in the report, it's not all that hard to do.  
20 But there are a large number of lists, and I guess the  
21 best possible outcome, if you went through many of  
22 these, and they all seemed to fall in the same range,  
23 then you'd get some assurance that you had a pretty  
24 representative set of scenarios here.

25 The last one, Scenario 3, is the worst

1 case where you have -- they put an individual living  
2 adjacent to two spray sectors, so you're doubly exposed  
3 again at each of these three ages, and then they go  
4 through and calculate the risks under those different  
5 scenarios.

6 So that's roughly what they did. They  
7 did a worst case analysis and in looking at the risk  
8 numbers you always have to go back and I'm afraid it's  
9 cumbersome to look at the assumptions that they use and  
10 the data they use for making their worst case analysis  
11 to judge even just how pessimistic it is. We can go  
12 through that in detail, if you like.

13 Q. Well, I think I understand now. I  
14 was just trying to understand how the Crump report was  
15 done. Would it be fair to say that this type of  
16 exposure scenario, where you have three exposures or  
17 potentially in the worst case six exposures for someone  
18 who lives adjacent to two spray blocks, would not be  
19 representative of the situation with respect to  
20 insecticides, assuming that they were sprayed year  
21 after year after year?

22 A. If that were the case, I haven't  
23 thought much about insecticides, but if in fact they  
24 were sprayed--

25 Q. Yearly.

1                   A. --much more frequently, you'd have to  
2                   take that into account in the evaluation. I haven't  
3                   given that much thought.

4                   DR. RACHMAN: A. You would also need to  
5                   look at the toxicity effects and it's important that  
6                   with insecticides you're not talking about cancer  
7                   effects, presumably you're talking about shorter term  
8                   effects.

9                   Q. Sublethal effects.

10                  a. So that changes the way you do the  
11                  analysis.

12                  Q. Sorry. In what way would it change  
13                  it though?

14                  A. Maybe we ought to talk a little bit  
15                  about that. We dealt with it yesterday, the cancer  
16                  effects versus non-cancer effects and lifetime daily  
17                  doses.

18                  Q. All right. Just for clarification,  
19                  is this type of setting of scenarios that is set out in  
20                  Crump report, does that only deal with cancer risks, or  
21                  does it deal also with systemic?

22                  DR. RODRICKS: A. This particular  
23                  analysis deals with carcinogenic risks.

24                  Q. All right.

25                  A. The others are dealt with implicitly

1 in that the dose -- the maximum dose they say you might  
2 get under these assumptions or under the data leading  
3 to the worst case analysis might occur if you were,  
4 let's say, adjacent to an area only once in your  
5 lifetime or twice or three times, you are really  
6 getting the same dose each time; that's not going to  
7 change. Just that you get it -- the first time I think  
8 the maximum would be a period of seven days, so you  
9 might have three such seven-day periods in your  
10 lifetime, but the size of the dose wouldn't change.

11 So you could look at the same safety  
12 margins for that sort of repeated exposure as for the  
13 single spray exposure. So that's why they looked only  
14 at the cancer risks here in this section.

15 Q. Okay. Could you turn to page 314 of  
16 the Crump report.

17 A. Yes.

18 Q. And to the third paragraph, and  
19 perhaps I'll just read this into the record for the  
20 Board and for the rest of the people here:

21 "No available experimental evidence has  
22 explored the interaction in animals or  
23 humans of multiple applications of the  
24 one or more herbicides studied here when  
25 applied either together or sequentially."



1                   Now, I take it that the same would be  
2 true, Dr. Rodricks, with respect to multiple  
3 applications of insecticides, or could you speak to  
4 that? Are you aware of any studies exploring the  
5 interaction?

6                   A. Interactions, I'm sure there are  
7 some, but not very many. I can't recall. I know I  
8 have seen some, but it's not a large part -- not a  
9 large literature, no.

10                  Q. All right.

11                  MADAM CHAIR: Ms. Kleer, could you repeat  
12 that sentence please. What page is that on?

13                  MS. KLEER: This is on page 314 and it's  
14 the third paragraph and I'll read it again.

15                  "No available experimental evidence has  
16 explored the interaction in animals or  
17 humans of multiple applications of the  
18 one or more herbicides studied here when  
19 applied either together or sequentially."

20                  MADAM CHAIR: The assumption that Crump  
21 made in the worst case scenario were to three different  
22 herbicides?

23                  DR. RODRICKS: That's correct.

24                  MADAM CHAIR: But that wasn't multiple  
25 applications?

1 DR. RODRICKS: You wouldn't get exposed  
2 at each spraying episode to more than one herbicide, I  
3 assume. He assumed three different herbicides but  
4 separated in time by one, ten and then very late in  
5 life. Your question was about insecticides that  
6 might --

7 MS. KLEER: Q. Yes, has there been any  
8 sort of study on multiple applications of both  
9 insecticide and herbicide?

10 DR. RODRICKS: A. Oh. Not that I know  
11 of.

12 Q. All right.

13 A. About -- I'm sorry. When you say  
14 applications, do you mean -- this reference here is  
15 interactions toxicologically; that is, where you might  
16 have two together, a joint exposure or combined  
17 exposure of the two there might be some interaction  
18 between the chemicals to create a toxicity different  
19 from the two separately, is that -- that's what he's  
20 referring to.

21 Q. That's what he's referring to. I  
22 guess perhaps I should -- I'm asking another question.  
23 I really am getting at the question of whether or not  
24 there are any studies that deal with populations who  
25 are exposed to a variety of chemicals, whether it be

1 herbicide, you know a variety of herbicides.

2 MADAM CHAIR: Applied over their  
3 lifetime.

4 MS. KLEER: Applied over their lifetime

5 MR. MARTEL: A cocktail.

6 DR. RODRICKS: Whether there are  
7 epidemiology studies or studies of human populations  
8 exposed--

9 MS. KLEER: Q. Over their lifetime.

10 DR. RODRICKS: A. --to multiple--

11 Q. To multiple.

12 A. --pesticides?

13 Q. Yes.

14 A. Some of the worker studies that we  
15 have talked about the last two days, the occupational  
16 studies with phenoxies involved certainly other  
17 herbicides and pesticides.

18 Q. Herbicides and insecticides, or...

19 A. I think in some of the Swedish  
20 studies there is reference to insecticides, but  
21 multiple herbicides at least.

22 I think in the Saskatchewan study there  
23 is some insecticides, but there's no -- these studies,  
24 as we have emphasized, it's really hard to separate the  
25 effects of the different agents, but I guess if your

1 question is, is there other studies that evaluate the  
2 interaction so that one knows the interaction, I think  
3 no, generally not; one of the reasons we apply safety  
4 factors in all of the toxicological analyses.

5 Q. All right. Just then as a general  
6 question: Do you agree that it would be necessary to  
7 look at exposure from all potential routes of pesticide  
8 exposure to properly assess human health risks to  
9 native populations that live in the forests or are  
10 living in the forests?

11 A. All routes of exposure?

12 Q. Yes.

13 A. Yes, I would want to look at all  
14 routes of exposure by the ways that they might come in  
15 contact with or enter the body, yes.

16 Q. And just again for clarification, has  
17 such a study ever been done to your knowledge?

18 A. Okay. There is two kinds of studies;  
19 one, the epidemiology study where you go out and study  
20 a population.

21 Q. All right. Let's first focus on  
22 that. Are you aware of any epidemiological study?

23 A. I am not.

24 Q. All right.

25 A. The Crump study is not that kind of

1 study, it's a more indirect evaluation of risk in the  
2 sense that you are looking at the levels of the  
3 pesticides that enter the environment, you look at how  
4 long they stay there, and then estimate from that the  
5 exposure that results. That's the Crump analysis and  
6 that's typical of what's done in the regulatory process  
7 prior to the registration of a material.

8 If enough -- talking about follow up and  
9 to see whether any particular population has been  
10 affected, you know, almost all of those that have been  
11 done are occupational sectors.

12 MS. KLEER: Those complete my questions.  
13 Thank you very much. Oh yes, we should distribute the  
14 copies.

15 MADAM CHAIR: Please, of Exhibits 1256  
16 and 1257. Did you want to give us the titles?

17 MS. KLEER: Yes. Exhibit 1256 which is  
18 the three-page summary is memorandum -- I'm trying to  
19 get the date -- well, it's stamped May 8, 1987 but I  
20 think that's the receipt date.

21 DR. RACHMAN: No, I'm sorry, that is the  
22 EPA date. That is the way they do it.

23 MS. KLEER: It is the EPA date. Okay.

24 DR. RACHMAN: Yes.

25 MS. KLEER: So the memorandum dated May



1 8, 1987, entitled: Sumithion, Toxicology Chapter of  
2 the Registration Standard, and that was Exhibit 1256.

3 Exhibit 1257 is entitled: Toxicology  
4 Profile, and would it be fair to say, for fenitrothion?

5 DR. RODRICKS: Yes, Madam Chair.

6 MS. KLEER: Okay.

7 MADAM CHAIR: And the author is EPA?

8 MS. KLEER: The author is also EPA and it  
9 appears to be, from Dr. Rachman's evidence and from her  
10 note, a toxicology branch review.

11 All right. Now I really am done. Thank  
12 you very much.

13 MADAM CHAIR: Mr. Freidin?

14 MR. FREIDIN: I don't anticipate being  
15 very long, Madam Chair. I am just wondering whether  
16 the witnesses could arrange the following exhibits or  
17 have the following exhibits before them, and things  
18 will probably go more quickly.

19 Exhibit 1236, which is the Record of  
20 Decision, the little thin document in relation to the  
21 southern region of the U.S. Forest Service, this  
22 document here. 1237, which is the Final Environmental  
23 Impact Statement for the Ozark/Ouachita Mountains,  
24 1247, which is the Woods report, 1244 which is the  
25 Saskatchewan study, and 1248 which is the Blair paper.

1 DR. RACHMAN: The Blair editorial.

2 MR. FREIDIN: The, editorial, yes.

3 CROSS-EXAMINATION BY MR. FREIDIN:

4 Q. If I might begin with you, Dr.

5 Rachman. I want to just ask a few questions regarding  
6 the discussion about risk assessment as opposed to risk  
7 management that took place a couple of hours ago.

8 DR. RACHMAN: A. Yes.

9 Q. It's my understanding from your  
10 evidence that when you were looking at risk management  
11 that public perception or public concern, quite apart  
12 from whether it's based on scientific evidence, is a  
13 factor which is taken into account by a risk manager?

14 A. It's a factor that may be taken into  
15 account, yes.

16 Q. Yes. And would you agree with me  
17 that when you're looking at a particular product like a  
18 herbicide which is used to achieve a certain purpose in  
19 the forestry setting, that the need for the product to  
20 carry out a successful forestry program would be  
21 another factor that the risk manager would take into  
22 account?

23 A. If we're talking about forestry  
24 product, yes.

25 Q. Yes. Therefore, would you agree that

1 in a situation where a forest manager didn't regard the  
2 product as an essential tool for forestry, that the  
3 risk manager would consider that in determining how  
4 much weight to give to the public perception or concern  
5 about the use of that product when deciding whether in  
6 fact they were going to go ahead and use it?

7 A. That sounds like a reasonable  
8 scenario to me.

9 Q. And I think in your evidence in  
10 relation to Exhibit 1236 that was the point I think  
11 that you were making; was it not, when you referred to  
12 page 11?

13 A. Yes, yes.

14 Q. And could you turn to Exhibit 1237,  
15 which is the final EIS, the introduction, (xii), and  
16 under the heading Human Health and Safety, do you have  
17 that?

18 A. Yes, I do.

19 Q. And (xii), under the heading Human  
20 Health and Safety, the first sentence reads:

21 "All herbicides and additives  
22 investigated provide ample margins  
23 of safety for the public when applied  
24 using typical rates and methods."

25 I read that, Dr. Rachman, and it seems to

1 suggest to me -- or suggests to me that the decision  
2 not to use 2,4-D in this particular case must have been  
3 based on something other than scientific evidence that  
4 the 2,4-D was constituting an unacceptable health  
5 hazard?

6 A. I would agree with that.

7 Q. All right.

8 MR. CASTRILLI: Excuse me, Madam Chair.  
9 I have an objection to this line of questioning and I  
10 believe it's the kind of concern that I'm going to have  
11 with many of Mr. Freidin's questions, since virtually  
12 every single exhibit he proposes to deal with during  
13 the course of his "cross-examination" is a document I  
14 filed during my cross-examination.

15 Mr. Freidin has been asking nothing but  
16 leading questions of these witnesses since he began  
17 and, in my respectful submission, it is nothing more  
18 than an attempt to deal in cross-examination with  
19 matters that are only appropriately dealt with through  
20 re-examination and during which Mr. Cassidy could not,  
21 under any circumstances, be permitted to ask leading  
22 questions.

23 If Mr. Freidin is going to persist in  
24 this line of examination, I'm going to reserve my right  
25 to ask further questions and, more importantly, if he's



1 going to ask a leading question every time he asks a  
2 question of these witnesses, I'm going to object to his  
3 entire cross-examination.

4 MR. FREIDIN: Well, my response to that,  
5 Madam Chair, is that Mr. Castrilli, his client and my  
6 clients are not in support of each other. It is my  
7 right as a party here, in my respectful submission, to  
8 cross-examine these witnesses on evidence that they  
9 have given, and particularly evidence that they have  
10 given in cross-examination in answer to questions from  
11 Mr. Castrilli, and that the manner in which I'm asking  
12 my questions are quite proper.

13 I don't think I can really add anything  
14 more. That's my understanding of the law, and I don't  
15 think there's anything improper about my actions.

16 MR. CASTRILLI: Madam Chair, there is one  
17 point that Mr. Freidin neglected to note and that is  
18 the position of his client vis-a-vis the OFIA, and  
19 these witnesses are the witnesses of course of the  
20 OFIA.

21 The question is: Is there a difference  
22 of opinion as between the MNR and OFIA with respect to  
23 the evidence of this particular panel, and if that's in  
24 fact not the case, then Mr. Freidin should have asked  
25 his questions before I did and not after.



1                   MADAM CHAIR: Well, the Board made it  
2 clear to Mr. Freidin last week, Mr. Castrilli, that we  
3 wouldn't listen to questions to witnesses who are  
4 essentially supporting his client's case.

5                   It didn't come up with respect to leading  
6 questions of the witnesses, but just that the Board  
7 wasn't prepared to go into long cross-examination on  
8 evidence that supported the Ministry's case, that isn't  
9 the situation here.

10                  MR. CASTRILLI: Well, Madam Chair, if  
11 you'll recall the question that Mr. Freidin asked of  
12 the witness relating to page (xii) of Exhibit 1237,  
13 he's simply now going back through the evidence I dealt  
14 with, yesterday I guess it was, to elicit a different  
15 response from these witnesses.

16                  In my respectful submission this document  
17 was available to Mr. Freidin prior to the commencement  
18 of this cross-examination -- or my cross-examination.  
19 If he had questions to put to these witnesses then, he  
20 should have put them before I had asked my questions.

21                  At this point he's simply trying to deal  
22 with my cross-examination after I'm in a position not  
23 normally being able to ask questions to deal with the  
24 case I have to meet. Mr. Freidin doesn't have a case  
25 to meet with respect to Mr. Cassidy's case, their

1 position with respect to this evidence is ad item. So  
2 I'm objecting to the question Mr. Freidin asked and I  
3 would like a ruling.

4 MR. CASSIDY: Well, I'm not sure who has  
5 to meet what case here; Mr. Freidin is the proponent  
6 who has a burden, Mr. Castrilli has no burden  
7 whatsoever to meet in this whole hearing and, in my  
8 second submission in respect of his comments - and this  
9 is more a matter for these two to debate - but my  
10 second submission in respect of his comments is that  
11 the issue of order of cross-examination was decided at  
12 the outset well before Mr. Castrilli stood up to deal  
13 with it today, and with the greatest respect to Mr.  
14 Castrilli and with the greatest respect to his client,  
15 who has been represented in each one of our panels, the  
16 time for this particular objection should have been  
17 made some time ago and --

18 MADAM CHAIR: I must have mistaken --

19 MR. CASSIDY: That issue was decided.

20 MADAM CHAIR: I must have mistaken, Mr.  
21 Castrilli, I thought you meant that Mr. Freidin should  
22 have presented this during his case. You meant he  
23 should have cross-examined before you.

24 MR. CASTRILLI: If Mr. Freidin is going  
25 to go through a series of exhibits that were already on

1 the record, then he should have gone ahead of me and,  
2 in any event, even if the issue that Mr. Cassidy raised  
3 about the order of cross-examination having been dealt  
4 with previously, I'm now dealing with the question of  
5 leading questions.

6 Mr. Freidin is asking questions of these  
7 witnesses which direct their attention to obtaining a  
8 yes or a no answer. In my respectful submission,  
9 that's a leading question.

10 If Mr. Freidin is going to go after me  
11 and deal with my cross-examination in the manner he  
12 clearly proposes to do then, in my respectful  
13 submission, the only questions he should be permitted  
14 be asking at this stage are questions that are not  
15 leading questions and are more properly characterized  
16 as examination-in-chief.

17 MR. FREIDIN: Madam Chair, maybe I can --  
18 maybe we should try this. Why don't we see if I can do  
19 this without asking questions which my friend objects  
20 to as being leading, and if it turns out that I can't,  
21 then perhaps we could deal with the issue, but we may  
22 be able to solve this, if I can sort of proceed.

23 MADAM CHAIR: What you just objected to,  
24 Mr. Castrilli, was that the fact that Mr. Freidin asked  
25 Dr. Rachman to agree with that part of the sentence

1           that he put to her on page (xii)?

2                       MR. CASTRILLI: Let me be clear about the  
3           concern I have, Madam Chair.

4                       A leading question is one that directs  
5           the witness' attention to a particular passage, for  
6           example, and essentially asks him to provide a yes or  
7           no answer.

8                       Now, that is not normally permitted of  
9           anyone who is engaging in examination-in-chief or would  
10          be doing a re-examination, as would Mr. Cassidy, I  
11          presume shortly. Mr. Freidin in a position where he's  
12          essentially ad item with the witnesses he's examining  
13          is getting the kind of benefit that is not normally  
14          open to him, he's simply not normally in a position to  
15          cross-examine a witness that is not hostile to his  
16          position.

17                      He's attaining that benefit now by asking  
18          leading questions, and I'm prepared to let Mr. Freidin  
19          ask a series of questions if he can do it without  
20          leading the witnesses.

21                      MADAM CHAIR: Why don't we get started,  
22          Mr. Freidin, and see.

23                      MR. FREIDIN: Let's go ahead and try it.  
24          I have used up my whole 20 minutes.

25                      Q. All right. Can you confirm for me,

1 Dr. Rachman, that whether or not the Record of  
2 decision, Exhibit 1236, indicates that the risk  
3 manager, in that case the forester, indicated whether  
4 or not the aerial application of herbicides was or was  
5 not an essential tool to be used in forestry in his  
6 region?

7 DR. RACHMAN: A. You're talking now  
8 about Exhibit 1236?

9 Q. That's correct.

10 A. Mr. Freidin, I would want to look  
11 through this document again. I don't remember from  
12 reading it.

13 MR. FREIDIN: Madam Chair, with your  
14 permission I would like to direct the witness to a  
15 passage and ask her whether in fact it addresses that  
16 question, rather than have her take the time to search  
17 through it.

18 MADAM CHAIR: Proceed, Mr. Freidin.

19 MR. FREIDIN: Q. Would you please refer  
20 to page 13.

21 MADAM CHAIR: Roman numeral?

22 MR. FREIDIN: No, page 13 of the report,  
23 there's a heading Aerial Application.

24 MADAM CHAIR: Which Section on page 13?

25 MR. FREIDIN: Under the heading Aerial



1 Applicayion -- oh, Exhibit 1236 --

2 MADAM CHAIR: The wrong one, okay.

3 MR. FREIDIN: Q. Page 13, there's a  
4 heading Aerial Application, and let me read that to  
5 you. It says:

6 "Some people feel that aerial  
7 herbicide application increases risks to  
8 humans and the environment, however,  
9 aerial application actually reduces  
10 worker risk from herbicides because only  
11 the mixer/loader comes in close contact  
12 with the chemical." Reference to the  
13 final EIS is made.

14 "Risk to the public is also very low with  
15 our required mitigations. In spite of  
16 findings about the utility and safety of  
17 aerial applications, I have determined  
18 that there are no locations within the  
19 study area where it is an essential tool;  
20 that is, we can accomplish our objectives  
21 in other ways, therefore, I am not  
22 allowing aerial applications of  
23 herbicides in the selected alternative."

24 So can we agree that the risk manager in  
25 this case makes an observation as to whether the tool

1 is essential or not?

2 DR. RACHMAN: A. Yes.

3 Q. Thank you.

4 MR. CASTRILLI: Madam Chair, excuse me.

5 MADAM CHAIR: Yes, Mr. Castrilli?

6 MR. CASTRILLI: Mr. Freidin has just  
7 asked a classic example of a leading question. He has  
8 directed the witness to a passage and he's asked him to  
9 confirm yes or no. That is a leading question, and  
10 that is something that would not be permitted of Mr.  
11 Cassidy in re-examination and, in my respectful  
12 submission, cannot be given any weight if Mr. Freidin  
13 is going to do it in this manner.

14 MADAM CHAIR: Well, Mr. Castrilli, in the  
15 25 months that we have been conducting this hearing  
16 there have been probably hundreds of times that the  
17 witnesses have been directed to provide a yes or no  
18 response to a question.

19 MR. CASTRILLI: That's exactly right.  
20 Anyone cross-examining can ask a leading question, the  
21 question however is - and that is only with respect to  
22 a witness that is adverse in interest to the witness  
23 giving the evidence.

24 Mr. Freidin is not adverse in interest  
25 with respect to these witnesses, he's taking an

1 opportunity provided by him with respect to  
2 cross-examination generally and turning it into an  
3 opportunity to cross-examine witnesses that do not  
4 disagree with him.

5 Now, Mr. Cassidy could not do that in  
6 re-examination and he could not do that in  
7 examination-in-chief and, in my respectful submission,  
8 Mr. Freidin cannot do it during his cross-examination.

9 He's going to have to be restricted to  
10 asking questions that are open-ended and not direct  
11 witnesses to particular passages and do not ask them to  
12 provide either a yes or a no, otherwise quite frankly  
13 you cannot give any weight to the answers your  
14 receiving from the questions that are being asked.

15 So I'm putting my objection onto the  
16 record. This manner of cross-examination, in my  
17 respectful submission, is simply not proper.

18 MADAM CHAIR: Mr. Castrilli, tell the  
19 Board how we would get that piece of information that  
20 we just received in the last question with respect to  
21 other aspects of the decision that the forester went  
22 into when making the decision in the Ozarks not to use  
23 herbicide spraying?

24 MR. CASTRILLI: Madam Chair --

25 MADAM CHAIR: I mean, I'm talking about

1 getting to the essence of the question to overcome your  
2 objection to asking the leading question.

3 MR. CASTRILLI: Madam Chair, the only --  
4 in my view, the only way for the matter to be dealt  
5 with is for Mr. Cassidy to deal with the matter in  
6 re-examination, if he wants to and there, as he well  
7 knows, he could not ask leading questions, however, he  
8 would purport to do it, is entirely up to him, but I'm  
9 dealing with the question of Mr. Freidin.

10 Mr. Freidin, not in opposition to the  
11 position of the witnesses giving evidence, is  
12 purporting to take the opportunity nonetheless to ask  
13 them leading questions. He's not permitted to do that,  
14 and if they were his witnesses he couldn't do that in  
15 examination-in-chief and he can't do it in  
16 re-examination and, in my view, it's an abuse to permit  
17 him to do it during cross-examination.

18 MR. MARTEL: Mr. Castrilli, are you  
19 objecting to the fact that he's just seeking a yes or  
20 no answer? If he were seeking an answer that would  
21 require some elaboration - and I concur with my  
22 colleague, how do we get -- from the cross-examination  
23 you did we got the position - I mean, everybody is  
24 selective, I don't care where you're at, people are  
25 selective in what information they elicit, they try to

1        elicit answers they want, that's from both sides of the  
2        deck. I mean, one only has to sit here and realize  
3        who -- you don't have to know who somebody's  
4        questioning on behalf of whether they're a proponent or  
5        a opponent, you know.

6                    So I'm trying to find out from you, if I  
7        wanted to find out whether that statement and let's go  
8        back -- so I can put the question to you, let's go back  
9        to Human Health Safety, the first statement which you  
10       objected to--

11                   MR. CASTRILLI: I'm sorry --

12                   MR. MARTEL: --back on page (xii), Mr.  
13       Castrilli.

14                   MADAM CHAIR: 1237.

15                   MR. MARTEL: And that's 1237. The first  
16       sentence says:

17                   "All herbicides and additives  
18                   investigated provide ample margins of  
19                   safety."

20                   And maybe I'm wrong, but everything I've  
21       heard for the past two days was away from that, in fact  
22       that it was not providing, that there were reasons why  
23       we should look at other things.

24                   Now, tell me how someone puts across to  
25       me that in fact that that sentence is in place, that in



1 fact it says that it's safe, there are ample margins of  
2 safety? How would someone do it? I ask you that, I  
3 mean, I'm not a lawyer.

4 MR. CASTRILLI: Mr. Martel, perhaps I can  
5 clarify this. The concern that arises - I put the  
6 proposition to you this way: Questions which directly  
7 suggest the answer are leading questions and are  
8 improper. An example of that is a question that would  
9 lead to a yes or no answer; another type of question  
10 that is inappropriate in a leading context is one that  
11 invites the witness to agree with another witness or  
12 agree with the document or disagree with a document;  
13 and a third one, and third type of leading question  
14 that's inappropriate is one that assumes a fact in  
15 dispute.

16 Now, the reason why each of those types  
17 of questions are inappropriate is because they come  
18 from the counsel -- normally they come from the counsel  
19 directly to his own witnesses, and that is why in the  
20 normal course courts do not permit that type of  
21 question to be asked.

22 What we have here is a very unusual  
23 situation, we have Mr. Freidin who did not call these  
24 witnesses nonetheless purporting to ask them leading  
25 questions. He's getting a free ride in effect in

1 asking questions of those types.

2 MADAM CHAIR: And he hasn't done this for  
3 the nine panels, Mr. Castrilli? The unusual situation  
4 is that we're just being asked now about --

5 MR. CASTRILLI: Madam Chair, this is the  
6 first panel I've been here for re-examination. As you  
7 well know, my clients do not have the resources to be  
8 here all the time and may not have been here all the  
9 time.

10 The point of the matter is, having  
11 identified a problem with this particular panel, I have  
12 an obligation to bring the problem to your attention  
13 and I'm doing so now.

14 MADAM CHAIR: Mr. Huff?

15 MR. HUFF: I make the suggestion that  
16 that is exactly the reason why Mr. Castrilli is here  
17 today.

18 MADAM CHAIR: Mr. Freidin, put the  
19 questions to the witness, and can you avoid asking  
20 leading questions?

21 MR. FREIDIN: Yes, I think I can.

22 MADAM CHAIR: Is it going to take longer?

23 MR. FREIDIN: No, I don't think so. Let  
24 me try. I mean, it was almost a question I didn't have  
25 to ask, it was the second part of the question -- let

1 me continue.

2 MADAM CHAIR: Mr. Castrilli, the Board  
3 understands your objections and we're instructing Mr.  
4 Freidin to not ask leading questions of the witnesses.

5 MR. CASTRILLI: Thank you, Madam Chair.

6 MR. FREIDIN: Q. Dr. Rachman, I am going  
7 to put a hypothetical to you and ask you whether you  
8 can agree with it or not.

9 If there is evidence before a risk  
10 manager that there are only two herbicides registered  
11 for forestry use, 2,4-D and glyphosate, and the risk  
12 manager accepts evidence that both of those herbicides  
13 were essential tools to be used to carry out an  
14 effective forestry program and also accepts that the  
15 aerial application of those herbicides was also  
16 essential to carry out a reasonable forestry program,  
17 would that situation be different than the situation  
18 you understand was being faced by the forester who  
19 prepared the Record of Decision in Exhibit 1236?

20 DR. RACHMAN: A. Mr. Freidin, what I  
21 don't recall from my brief reading of this document is  
22 whether or not the forester in fact said that both of  
23 those chemicals were essential tools.

24 I would want to go through this document  
25 again to be sure. This paragraph on page 13, my

1 understanding here is that what the forester is saying  
2 is that aerial application of whatever is not an  
3 essential tool.

4 Q. All right.

5 A. That is, aerial application of  
6 herbicides, period, is not an essential tool.

7 Q. Let's accept that's true. If there  
8 was another situation in another jurisdiction, let's  
9 use Ontario as an example, and if a risk manager in  
10 Ontario had a different view and the fact it was  
11 accepted as a fact that the use of 2,4-D and glyphosate  
12 were essential tools to carry out a forestry program,  
13 and that the aerial application of those herbicides was  
14 also an essential tool to carry out the forestry  
15 program, would the situation in that Ontario situation  
16 as I've described to you be different than the  
17 situation which was faced by the forester who prepared  
18 Exhibit 1236?

19 A. Yes, I would have to say it would be.

20 Q. Different in what respect?

21 A. As to the essentiality of the aerial  
22 application.

23 Q. Thank you. Dr. Rodricks, you made  
24 reference or there was discussion with Mr. Castrilli  
25 regarding the latency period in which tumors -- it



1 would take certain cancers to manifest itself in  
2 humans.

3 DR. RODRICKS: A. Yes, we had a  
4 discussion of that.

5 Q. Right. And could you just help me:  
6 Do the animal studies provide any insight or  
7 information about the potential for cancer to develop  
8 in humans many years into the future due to an exposure  
9 at a particular point in time?

10 MR. CASTRILLI: Madam Chair, I don't know  
11 whether this is going to work or not. There are such  
12 things as open-ended questions. Mr. Freidin is still  
13 not asking open-ended questions, he's asking questions  
14 that are eliciting or purporting to elicit a yes or no  
15 answer from these witnesses and, in doing so,  
16 suggesting the answer in the manner in which the  
17 question is asked. That is a classic definition of a  
18 leading question.

19 Now, I'm sure Mr. Freidin is in a  
20 position and knows how to ask an open-ended question,  
21 and you have already directed him to do so, and I'm  
22 simply repeating my objection.

23 I would like Mr. Freidin not to lead  
24 these witnesses during his cross-examination.

25 MADAM CHAIR: Can you rephrase the



1 question, Mr. Freidin?

2 MR. FREIDIN: Q. Are there any types of  
3 studies which are done by toxicologists that assist in  
4 determining whether certain chemicals can cause cancer  
5 tumors in humans?

6 DR. RODRICKS: A. We use animal studies  
7 for that purpose. There are some limitations to the  
8 inferences you can draw from animal studies, but we  
9 generally assume that results from such studies have  
10 some predictive power for predicting potential risks in  
11 humans, yes.

12 Q. What if one is concerned about lack  
13 of information -- that's fine. Would you turn to  
14 Exhibit 1247, please.

15 A. Yes.

16 Q. That is the Woods study. Would you  
17 turn to page 903, please. Table 4, this is the table  
18 where, in the second last line, we have spraying  
19 forests with herbicides is the occupation or activity  
20 and we have an NHL OR of 4.80.

21 A. That's correct.

22 Q. And that is the highest OR in the  
23 column?

24 MR. FREIDIN: And I hope you don't object  
25 to that, Mr. Castrilli, it's leading.

1 Q. It is?

2 A. It's the largest value, yes.

3 Q. All right. What is the role, if any,  
4 of the confidence interval which is shown or is there  
5 any relationship -- what is the role, if any, of the  
6 confidence interval in assessing the significance of  
7 the 4.8 OR?

8 A. Well, perhaps most importantly  
9 whether -- the question of whether the low end of that  
10 interval rises above one; if it does rises above one  
11 that gives you an indication of a statistically  
12 significant elevation in the odds ratio.

13 The other information it provides is  
14 given by the width of that confidence interval: The  
15 narrower the confidence interval the more confidence,  
16 if you like, you have that the actual OR is close to  
17 the true value; the wider the interval, the less  
18 certain you are about its true value.

19 Q. All right. In this particular  
20 case --

21 A. The width of that confidence interval  
22 is a function of -- largely a function of the size of  
23 the population or the number of, in this case, cancer  
24 cases that were used to develop -- available to develop  
25 that OR. Not very many.

1 Q. All right. Not very many in this  
2 particular case?

3 A. That's right.

4 Q. And is there any significance to  
5 that, the fact that we have got a small sample size?

6 A. Well, as we say in our witness  
7 statement, these values will then be what the  
8 statisticians call or the epidemiologists call  
9 unstable, they are subject to variation upward or  
10 downward with very small changes in the number of  
11 cancer cases.

12 So you just have less confidence in the  
13 value as a function of the width of that confidence  
14 interval. The wider the interval, the less confidence  
15 you have you're close to the true value.

16 Q. Is one able to make any conclusions  
17 as to whether the OR would be higher or lower if you  
18 had a larger sample, just from that information?

19 A. Not the OR, no. A larger sample  
20 would tend to reduce the confidence interval, that is  
21 generally...

22 Q. All right. Could you turn to Exhibit  
23 1248, which is the Blair study.

24 A. Yes.

25 Q. It may not necessary to refer to

1       that, Dr. Rodricks, but during your cross-examination  
2       by Mr. Castrilli you said that the Saskatchewan study  
3       is ecologic in nature, that this type of study usually  
4       leads to an analytic study and that the Saskatchewan  
5       study suggests two associations.

6               I wanted to know what you meant by two  
7       associations being suggested in the Saskatchewan study?

8               A. Yes. One of the associations is the  
9       one we discussed extensively, and that is the elevated  
10      risks on farms of smaller size I think under the one  
11      thousand acres of non-Hodgkin's lymphoma in those  
12      populations, and other one that stands out is the  
13      elevated risk of the same disease as a function of  
14      expenditures for fuel oil. That was the other thing  
15      that stood out in that Saskatchewan study.

16              Q. And during your evidence, if you were  
17      looking at Exhibit 1248, you were referred to on page  
18      544, the right-hand column, the second full paragraph  
19      it says: "Finally..."

20              "Finally, the association was specific  
21      among these farmers...", et cetera.

22              A. Yes.

23              Q. You were asked whether you agreed  
24      with that and you agreed subject to the qualification  
25      that there should have been -- or it should have said

1           that there was an independent association with the  
2           expenditure on fuel.

3                   A. To be complete, I think that should  
4           have been added, yes.

5                   Q. Right. All right. Go back to page  
6           544, look at the left-hand column, second paragraph,  
7           last sentence. It says:

8                   "These excesses could not be explained by  
9                   education, income, ethnic background,  
10           production of specific crops or use of  
11           fertilizers or insecticides."

12                   Okay?

13                   A. That's correct.

14                   Q. And then if you go the paragraph I  
15           took you to originally which says, "Finally...", it  
16           says:

17                   "...among these farmers an association  
18                   with herbicide use was limited to  
19                   non-Hodgkin's lymphoma...", and then it  
20           says,

21                   "...and could not be explained by  
22                   education, income, ethnicity,  
23                   expenditures on fuel  
24                   or use of fertilizers or insecticides."  
25                   In one case they say it could not be



1 explained by expenditures on fuel, in the second  
2 paragraph if you go down to the -- on the right-hand  
3 column, if you go to the left-hand column it says - he  
4 doesn't use those words, it says:

5 "Production of specific crops."

6 Can you provide any explanation as to --

7 A. I was getting at a slightly different  
8 point. I can't explain why it didn't mention fuel in  
9 the first sentence you referred to.

10 Q. Right.

11 A. But the point was here that if you  
12 isolate and separate the effect of how much money these  
13 farmers spent on fuel oil, the association with  
14 herbicide use remained, it wasn't a function of the two  
15 combined.

16 Now, there was still an independent  
17 association of fuel oil expenditures, so I was simply  
18 adding that that ought to have been mentioned as well.

19 Q. Okay. And my last question is for  
20 you, Dr. Rodricks. You were asked by Mr. Castrilli  
21 whether there were any known carcinogens with positive  
22 epis and negative animal studies, and my note indicates  
23 that you said: Yes, only one, and you made reference  
24 to arsenic.

25 Do I have a correct recording of your

1 evidence.

2 A. And if that's all I said, it was  
3 perhaps incomplete, but I guess that's what I did say.

4 Q. Well, perhaps you could --

5 A. Maybe I could elaborate a little bit.

6 Q. Please do.

7 A. The evidence on -- we have no  
8 positive, convincingly positive animal study on  
9 arsenic, it is the only human carcinogen I know of  
10 where that exists, but I almost say we have no real  
11 adequate test of arsenic in animals.

12 Most of the tests that have been done,  
13 because -- it's been hard to find the right dose to do  
14 a long-term study with arsenic because animals tend to  
15 die of arsenic poisoning. It's not really a good test.  
16 So it's not really negative or quite.

17 MR. MARTEL: It's pretty negative if  
18 you're the animal.

19 DR. RODRICKS: That's correct. So my  
20 conclusion was close. There was just more inadequate  
21 animal data rather than clearly negative date.

22 MR. FREIDIN: Q. Okay. Now, you said  
23 later on in your evidence that you did not believe that  
24 there was any scientific basis to place additional  
25 restrictions on the use of 2,4-D in forestry, and when

1       you gave that evidence did you -- I assume you had the  
2       opinion about -- you were aware of the situation with  
3       the arsenic that you just described to me?

4               MR. CASTRILLI: Excuse me, Madam Chair.

5               MR. FREIDIN: Oh come on, Mr. Castrilli.  
6       If I can't ask that kind of a leading question, I mean  
7       any judge, Madam Chair, will allow leading questions  
8       that are just to get the flow of the evidence.

9               I mean, I'm not putting words in his  
10       mouth, I'm just trying to get him to say what he just  
11       finished saying. I mean --

12              MADAM CHAIR: Well, what's your objection  
13       to this one, Mr. Castrilli?

14              MR. CASTRILLI: I agree with Mr. Freidin  
15       that there are preliminary matters or form matters that  
16       are not in dispute for which leading questions are  
17       permissible. That's not, in my view, what Mr. Freidin  
18       was asking. I'm simply going to ask him to ask the  
19       question without leading the witness.

20              MR. FREIDIN: It's going to take such a  
21       long time.

22              Q. Does the situation that you described  
23       with arsenic affect your opinion regarding whether  
24       there should be additional restrictions placed on the  
25       use of 2,4-D in forestry?

1 MR. CASTRILLI: Madam Chair, that's  
2 another leading question. Mr. Freidin ought to know  
3 and does know, I'm sure he does know, what a leading  
4 question is and what a leading question is not; that is  
5 a question that directs the witness' mind unduly to  
6 what the answer should be.

7 MR. FREIDIN: No, it does not.

8 MR. CASTRILLI: If Mr. Freidin is going  
9 to ask a question that suggests the answer, we don't  
10 need the witness. That is precisely the problem with  
11 leading questions. I'm objecting to the question in  
12 that phrase.

13 MR. FREIDIN: That question doesn't  
14 suggest the answer. I asked him whether it had any  
15 effect and he would say yes or no, and when he says yes  
16 or no, I'll say, can you explain your answer.

17 There is nothing wrong with that  
18 question. A leading question suggests -- puts the  
19 words, almost makes the witness have to say yes or no.  
20 Like if I said: Now, isn't it true that you did this,  
21 you did this, you know.

22 If I asked him, Madam Chair, in this  
23 situation: Isn't it true -- I don't want to do this  
24 because he's sitting right there --

25 MADAM CHAIR: Yes. Let's just short

1 circuit this a bit. What are we trying to determine  
2 with this question, what is the question addressing?

3 MR. FREIDIN: What is it addressing?

4 MADAM CHAIR: Mm-hmm.

5 MR. FREIDIN: Oh well, Mr. Castrilli  
6 asked this question about, you know, are there any  
7 known carcinogens with positive epis and negative  
8 animals studies, and he said: Yes, only one, arsenic.  
9 I'm just trying to find out whether that is relevant or  
10 should be given any weight by the Board, if they're  
11 trying to figure out -- make a decision as to whether  
12 2,4-D should have additional restrictions on it.

13 I mean, the evidence was elicited from  
14 this witness by Mr. Castrilli, who obviously is trying  
15 to get the Board to come to a certain conclusion about  
16 the use of 2,4-D, and all I'm trying to get from the  
17 witness is: Well, that's an interesting question,  
18 there may be an interesting answer, but has it got  
19 anything to do, or does it help the Board or have any  
20 relevance to the Board giving weight if they're trying  
21 to figure: Gee, does that have anything to do with  
22 whether we should put a restriction on 2,4-D. That's  
23 what I want the witness to answer.

24 MADAM CHAIR: I don't think that's a  
25 leading question in that way, Mr. Castrilli.



1                   MR. CASTRILLI: Well, now that Mr.  
2                   Freidin has put absolutely everything on the table that  
3                   he would like the witness to consider, I'm not sure  
4                   what the value of the answer is, but I won't object to  
5                   this question if it's Mr. Freidin's last one.

6                   MR. FREIDIN: It won't be my last one in  
7                   the hearing, Mr. Castrilli, you better be here every  
8                   day.

9                   MADAM CHAIR: Dr. Rodricks, I think that,  
10                  like you I am confused by all this, but I would think  
11                  the question has something to do with your answer about  
12                  the value of animal studies, the example of the arsenic  
13                  study you gave. Is the Board to take anything from --

14                  DR. RODRICKS: I don't think very much.  
15                  I mean, I think it probably bears, if on anything, the  
16                  question of whether the weight of evidence on the  
17                  carcinogenicity of 2,4-D points toward causation or  
18                  not, because animal data are one kind -- one additional  
19                  piece of evidence.

20                  Positive animal evidence would push it  
21                  toward the weight of evidence toward concern for human  
22                  cancer, and having both positive human data and no  
23                  animal data is an unusual situation; that is, no  
24                  convincing animal data. I don't -- I only know one  
25                  case like that, that's arsenic.

1                   But to tell you the truth, I have not  
2 brought that very much into my thinking when going  
3 through the weight of evidence.

4                   MADAM CHAIR: The sense of your evidence  
5 earlier today was that you place more importance on  
6 positive animal results than you did on the  
7 epidemiological studies given--

8                   DR. RODRICKS: Yes.

9                   MADAM CHAIR: --given the difficulties of  
10 accomplishing well-designed epidemiological studies.

11                  DR. RODRICKS: Yes, Madam Chair. When  
12 epidemiological studies are convincingly positive they  
13 surely get the most weight, there is no question about  
14 that, but when you have a situation like this where you  
15 have some suggestive evidence and it's not clear, I  
16 would place a reliance on animal data, positive or  
17 negative.

18                  MADAM CHAIR: And one confusion I had  
19 this afternoon was your reference to the two-year  
20 animal studies that are going on now. Is that the same  
21 study you're referring to as being done by the  
22 Industry?

23                  DR. RODRICKS: Yes. The Industry began a  
24 series of studies in the mid-80s on 2,4-D, conducted a  
25 full two-year study both in mice and rats, both sexes,

1 on 2,4-D, submitted that to EPA in I guess -- I don't  
2 remember the date.

3 DR. RACHMAN: We would have to go back to  
4 look at that.

5 MADAM CHAIR: Yes, we went through that  
6 and the MOE Panel decided to look at the rat study and  
7 the EPA felt both were inadequate.

8 DR. RODRICKS: That's right.

9 MADAM CHAIR: And now they're redoing  
10 those.

11 DR. RODRICKS: The EPA now has required  
12 new tests, but I don't know where those tests stand.

13 MADAM CHAIR: Oh, I had a sense that this  
14 afternoon you were saying you thought that they would  
15 also not be positive.

16 MR. RODMAN: Oh, no, I had no opinion on  
17 that.

18 MADAM CHAIR: You are basing your opinion  
19 on the negative animal studies.

20 DR. RODRICKS: That we have so far.

21 MADAM CHAIR: That we have so far, as of  
22 '87.

23 DR. RODRICKS: No, I wasn't going to  
24 predict whether there would be -- no, absolutely not, I  
25 wouldn't dare do that.

1 MR. FREIDIN: Those are my questions,  
2 Madam Chair.

3 MADAM CHAIR: Thank you, Mr. Freidin.  
4 Thank you, Mr. Castrilli.

5 Mr. Cassidy, how long are you going to  
6 take in re-examination?

7 MR. CASSIDY: Five minutes at the most.

8 MR. MARTEL: Go for it.

9 MADAM CHAIR: All right.

10 MR. FREIDIN: Such a big smile, Madam  
11 Chair.

12 MR. CASSIDY: I just have a -- my  
13 understanding of re-examination is I'm entitled to ask  
14 questions aimed at clarifying the evidence.

15 RE-DIRECT EXAMINATION BY MR. CASSIDY:

16 Q. And I have a question now arising out  
17 of Mr. Freidin's question in respect of Exhibit 1248  
18 where, Dr. Rodricks, I believe you identified that the  
19 Wigle study, Exhibit 1244, made -- or identified an  
20 independent association with fuel oil expenditures and  
21 NHL; is that correct?

22 DR. RODRICKS: A. That's right.

23 Q. Have I got that right, what your  
24 answer was to Mr. Freidin?

25 A. That's correct.

1 Q. Is there any potential significance  
2 to that fact, that the Wigle study made that  
3 independent identification?

4 A. Well, with these kinds of studies,  
5 the so-called ecological studies where you're just  
6 looking at trends in populations, when you see results  
7 like that that usually gives a signal to  
8 epidemiologists that something, if possible, ought to  
9 be done to follow up with a more analytic study.

10 So it's sort of hypothesis generated and  
11 there's enough suggestion in there to at least generate  
12 a hypothesis on the relationship between fuel oil and  
13 NHL, but nothing more than that.

14 MR. CASSIDY: Those are my two -- I had  
15 two questions.

16 Thank you, Madam Chair.

17 MADAM CHAIR: Thank you, Mr. Cassidy.

18 Thank you very much, Dr. Rachman and Dr.  
19 Rodricks.

20 DR. RODRICKS: You are welcome.

21 MADAM CHAIR: Thank you. And you are  
22 finished.

23 DR. RODRICKS: Good.

24 --- (Panel withdraws)

25 MADAM CHAIR: Are we going to -- are all



1 the parties here to start the five o'clock discussion,  
2 or are we--

3 MR. FREIDIN: Mr. Hanna's not here; is  
4 he? Oh, Mr. Quinney's here.

5 MADAM CHAIR: --or are we missing  
6 anybody?

7 MR. FREIDIN: Mr. Hanna is missing. Mr.  
8 Quinney is here, but Mr. Hanna apparently is coming at  
9 five o'clock.

10 MADAM CHAIR: So, shall we adjourn until  
11 five o'clock then? There is no point in --

12 DR. QUINNEY: Please, Madam Chair.

13 MADAM CHAIR: Thank you.

14 ---Recess taken at 4:50 p.m.

15 ---On resuming at 5:07 p.m.

16 MADAM CHAIR: Please be seated.

17 Ms. Swenarchuk?

18 MS. SWENARCHUK: Good afternoon, Madam  
19 Chair, Mr. Martel.

20 MADAM CHAIR: Your last correspondence  
21 was June 4th, 1990.

22 MS. SWENARCHUK: Oh, no there has been  
23 considerable correspondence since.

24 MS. DEVAUL: June 12th, Madam Chair.

25 MADAM CHAIR: Oh all right, okay. Yes,

1 I'm sorry. Yes, I saw a fax sheet on top, okay. Thank  
2 you.

3 MS. SWENARCHUK: Might I start by asking,  
4 Madam Chair, if the Board has any doubts as to the  
5 evidence of Dr. Thomas as an expert in the wildlife  
6 management field?

7 I understand that some question was  
8 raised about Mr. Mazer, which I plan to respond to, but  
9 I wonder if that pertains to Dr. Thomas or do the  
10 previous transcript references, some of which I  
11 referred you to, from Dr. Baskerville and Dr. Euler  
12 satisfy the Board that in fact Dr. Thomas is, I am  
13 informed, the pre-eminent wildlife biologist in North  
14 America.

15 MADAM CHAIR: Yes. I think the Board  
16 accepts that Dr. Thomas is well known in his field.

17 Do any of the parties have any objections  
18 to Dr. Thomas' qualifications?

19 MS. SWENARCHUK: Thank you. Then I  
20 outlined in my letter of June 12th, our reasons for  
21 requesting that the Board call Dr. Thomas, and I don't  
22 need to read the letter into the record.

23 If I could simply generalize from it,  
24 that my information from the wildlife biologists who  
25 have been advising us, it's our view that Dr. Thomas

1 can present the best evidence to the Board of different  
2 approaches to wildlife management, not only at the  
3 theoretical level but at the level of actual experience  
4 in implementation, and that based on his years of work  
5 with the United States Forest Service that he is the  
6 most qualified person and, in our view, can be the most  
7 helpful person to the Board in the Board's task of  
8 evaluating all of the evidence that the Board has heard  
9 and will hear on approaches to wildlife management, and  
10 assisting the Board in, as we will all attempt to do,  
11 in developing the approach to wildlife management that  
12 will continue from this time forward through the  
13 management planning process called timber management.  
14 That in a nutshell is the reason that we are proposing  
15 that the Board call this particular individual.

16 To state it another way, we consider that  
17 he's particularly able to give the Board the broad  
18 picture of wildlife management as it has been practiced  
19 in various jurisdictions, he has very broad experience,  
20 both in the United States and elsewhere, and in  
21 different forest types in the United States.

22 He's, in our view, the pre-eminent  
23 authority on the various ways of managing wildlife and  
24 wildlife habitat, particularly in the managed forest,  
25 and he has the knowledge and background to put into the

1 broader context of policy the site-specific research;  
2 that is, he can put that in the broader context of  
3 policy and scientific and implementation decisions.

4 Now, with that introduction we get into  
5 the question of whether the Board would agree to call  
6 him or whether he could appear for another party.

7 MR. MARTEL: I'm just inquiring if we're  
8 getting here who's witness he's going to be, because  
9 there is some conflict.

10 MS. SWENARCHUK: Yes.

11 MR. MARTEL: And I'm not sure, until that  
12 is decided, what type of witness he then is.

13 MS. SWENARCHUK: Right. Well, I wanted  
14 to -- you'll have to decide if you're going to  
15 sympathetically going to consider our request, whether  
16 this is someone who would be helpful, and that's why I  
17 gave you that introduction.

18 MR. MARTEL: No, I'm just wondering who's  
19 witness he is. I think Mr. Hanna told us last week he  
20 agreed to come on their behalf, and we have a  
21 difference of opinion, I think that's the first thing  
22 that has to be settled.

23 MS. SWENARCHUK: Yes, absolutely. And I  
24 don't know what Mr. Hanna is going to tell you about  
25 that today, I can only reiterate what I told you in my



1 letter to you of June the 12th, based on my telephone  
2 conversation with Dr. Thomas that day, which was that  
3 he informed me that he had not agreed to appear as a  
4 witness for the Ontario Federation of Anglers & Hunters  
5 and does not consider it appropriate that he appear for  
6 any individual party, and that should the Board invite  
7 him, however, he would be willing to, come and he has  
8 his director's permission on that basis.

9 This is consistent with what he had told  
10 me on previous occasions in this year and when we first  
11 met him in Toronto in March of 1987.

12 We have requested -- or we had discussed  
13 with him the possibility of coming as a witness for  
14 Forests for Tomorrow based on a letter of support which  
15 the Minister of the Environment was prepared to  
16 provide, and he told me quite explicitly that that  
17 would not be sufficient for him to come. That is my  
18 assumption, as I make that request of the Board, and as  
19 I say, it's based on information that I obtained again  
20 two days ago and we will just have to hear what Mr.  
21 Hanna has to say.

22 Perhaps we should deal with that before  
23 discussing Mr. Mazer.

24 MADAM CHAIR: Mr. Hanna?

25 MR. HANNA: Good afternoon, Madam Chair,



1 Mr. Martel. Before I begin I'd like to simply note  
2 that Mr. Morgan, who's the Executive Vice-President of  
3 the Ontario Federation of Anglers & Hunters and Terry  
4 Smeltzer who's a director of the Federation, both are  
5 present. Their presence is indicative of the  
6 importance that the OFAH considers this particular  
7 matter, and they were particularly interested in being  
8 here to hear the discussion with respect to these  
9 matters.

10 A second matter before I get started is,  
11 Ms. Swenarchuk made reference to a June 12th  
12 correspondence. I have to inform the Board that we did  
13 not receive that. I find this most unfortunate that I  
14 have not received that. We have made every effort in  
15 this matter to keep all of the parties informed as  
16 possible, to use the fax wherever possible to ensure  
17 that people are kept informed, and it is somewhat  
18 advantageous to us to receive this only moments ago now  
19 at the hearing.

20 MS. SWENARCHUK: I believe this was faxed  
21 to the most involved parties, and that included yours,  
22 Mr. Hanna.

23 MR. HANNA: Well, all I can tell you, Ms.  
24 Swenarchuk, is that I have people here that were in the  
25 office for the last two days and neither of them have

1 provided -- have any knowledge of it coming, and I  
2 would expect it would have appeared on their desk. If  
3 it has, then I'll accept that, but I don't have any  
4 copy of it and I would certainly, in the future, expect  
5 a copy at least to be sent to me also. I believe you  
6 have my fax number, it's not long distance, it's  
7 very -- we make that -- we try to do that to for  
8 yourself and that would certainly help me in preparing  
9 for these sorts of things.

10 Now, with respect to the matter of Dr.  
11 Thomas, I would first start by referring to Ms.  
12 Swenarchuk's letter of June 4th. In the second  
13 paragraph she indicates that, first of all, that both  
14 of the gentlemen who are under consideration here are  
15 federal employees of the United States and that it is  
16 the policy of the American Government that it's public  
17 servants may not testify in foreign proceedings, unless  
18 they are invited by government agencies of the foreign  
19 government.

20 That also is my understanding of the  
21 situation situation, and we have discussed this  
22 extensively with Dr. Thomas. This is the information  
23 that was provided to the OFAH, a number of months  
24 ago -- it's more than months now, it's over several  
25 years ago.

1                   With respect to this particular matter,  
2                   in my initial discussions with Dr. Thomas, he indicated  
3                   to me that he saw two options in terms of appearing  
4                   here as witness; one was to appear as a Board witness -  
5                   and that, I say, is clearly his preference, he would  
6                   prefer to appear as a Board witness and I'll explain  
7                   why in a moment - the second alternative is that he  
8                   receive approval or invitation by a government agency  
9                   to appear as a witness at the hearing, and because of  
10                  matters that go back with respect to Dean Baskerville  
11                  which were under consideration at the time that we were  
12                  discussing things with Dr. Thomas, we opted to go with  
13                  the second option.

14                 And, Madam Chair, I would like to  
15                 introduce some correspondence. I suppose we should  
16                 give it an exhibit because it will be on the record,  
17                 but it's a series of correspondence that go back and  
18                 cover our dealings with Dr. Thomas which may help  
19                 clarify the matter for the Board. If you will, I can  
20                 circulate these now. (handed)

21                 MS. SWENARCHUK: Can I just clarify a  
22                 point, Mr. Hanna. When Dr. Thomas indicated to you  
23                 that he would appear on the invitation or approval of a  
24                 government agency, did he indicate -- are you saying  
25                 that he said he would then appear for one of the

1 parties to the hearing other than the government?

2 MR. HANNA: I will be dealing with that,  
3 Ms. Swenarchuk, in a moment in my presentation. If I  
4 could just go through this correspondence perhaps,  
5 Madam Chair, it will clarify things somewhat.

6 The first letter is a letter from Mr.  
7 Simpkin who was then the Director of the Wildlife  
8 Branch, it was in response to a letter which is  
9 comparable to the following letter to Mr. Robertson who  
10 is the Chief of the U.S. Forest Service.

11 We first went to the Ministry of Natural  
12 Resources to see if they would have any objection to  
13 Dr. Thomas appearing as an expert on behalf of the OFAH  
14 and I believe Mr. Simpkin's letter is self-explanatory.

15 We then sent to Mr. Robertson the letter  
16 that you have in this package and the response from Mr.  
17 Simpkin, and we subsequently received the letter that  
18 is shown on the following page addressed to Mr. Morgan.  
19 This was where matters lay until we received the June  
20 4th letter from Forests for Tomorrow.

21 At that point I went back and looked at  
22 the letter because I was somewhat perplexed by the  
23 letter from Forests for Tomorrow relative to what our  
24 understanding of the situation was, and I read the  
25 letter again, and it was somewhat ambiguous. It



1 indicated that they were agreeable to making Dr. Thomas  
2 available to the Ontario Environmental Assessment Board  
3 and there was the potential there of that being as a  
4 Board witness, and I believe when I made the  
5 presentation or addressed the Board on this matter last  
6 Wednesday I indicated to you that we were in the  
7 process of trying to clarify things.

8 That was underway on that day and the  
9 letter that follows to Mr. Smythe is a letter from Dr.  
10 Quinney indicating the results of a telephone  
11 conversation that he had with Dr. Smythe and the  
12 letter -- the reason that Dr. Quinney called Dr. Smythe  
13 was to clarify any ambiguity that was outstanding in  
14 the letter of January 30th, 1990, and I believe the  
15 letter that is attached is self-explanatory.

16 Subsequent to that letter I sent to the  
17 Board and to the parties -- or excuse me, Dr. Quinney  
18 did, the letter dated June 8th, 1990 which I have not  
19 included in the package but I believe it was sent to  
20 the Board and the Board has copies of, and that letter  
21 outlines a discussion that Dr. Quinney had with both  
22 Dr. Thomas and Dr. Smythe.

23 Now, subsequent to that being circulated,  
24 as I understand, Ms. Swenarchuk then decided that she  
25 would go and speak to Dr. Thomas to find out if the



1 OFAH was telling the truth or whatever, and we  
2 subsequently learned of that from Ms. Swenarchuk when  
3 she said -- she phoned us and said I have talked to Dr.  
4 Thomas and he doesn't agree with what's in your letter.

5 So I immediately called Dr. Thomas and  
6 asked him what the status of things were, and he  
7 indicated to me exactly what our understanding had been  
8 from the beginning and; that was, that there was two  
9 options available; one option was for him to appear as  
10 a Board witness, the second option is for him to appear  
11 with approval of the provincial government.

12 His preference is clearly to appear as a  
13 Board witness. He's been consistent in saying that  
14 throughout. He has indicated, however, that with the  
15 invitation or approval he would be willing to appear.

16 This left us with - how should I say -  
17 one last hurdle to clear and that was Dr. Thomas wished  
18 to have a letter directed to him from the provincial  
19 government dealing specifically with this matter.

20 We then approached the now director of  
21 the Wildlife Branch, Dr. MacLean, who has appeared here  
22 as a witness, and asked if the position of the Ministry  
23 had changed in any way whatsoever, and that is the last  
24 piece of correspondence in the package. It's a letter  
25 to Dr. Thomas reconfirming the earlier letter by Dr.

1       Simpkin -- or by Mr. Simpkin. That is the chronology  
2       of where we stand at the present time.

3               Now, as I see it the Board has two  
4       operations still available to them; one option is to  
5       have Dr. Thomas appear as a Board witness, the second  
6       option is for him to appear under the invitation or  
7       approval of the provincial government.

8               My understanding at this time is that  
9       that that hurdle has been cleared as a result of our  
10      discussions with Dr. Smythe, that the U.S. Forest  
11      Service is of the view that it would be appropriate for  
12      Dr. Thomas to come forward, given the approval of the  
13      Ministry of Natural Resources.

14              MADAM CHAIR: But to come forward as a  
15      mutual witness, not on behalf of your client or Ms.  
16      Swenarchuk's.

17              MR. HANNA: My understanding, Madam  
18      Chair, is as shown in the letter of June 5th to Dr.  
19      Smythe. We confirmed in our telephone conversation  
20      that they are in agreement to have Dr. Thomas come to  
21      Toronto and to speak to yourselves as part of the OFAH  
22      presentation, that is our understanding at the present  
23      time.

24              MR. MARTEL: That is your preference.

25              MR. HANNA: Well, I'll get to that in a

1 minute Mr. Martel.

2 MR. MARTEL: I'm trying to short circuit  
3 this.

4 MS. SWENARCHUK: Excuse me, but could  
5 I -- I want to be totally fair here and I want to  
6 indicate, because my concern here is simply that Dr.  
7 Thomas appear. I'm not asking that he appear as  
8 Forests for Tomorrow's witness because he has  
9 explicitly said to me several times that he considers  
10 it inappropriate for him to appear here as a witness  
11 for any individual party. His director has said, or  
12 Mr. Quinney has confirmed that his director has  
13 indicated to the contrary as of June 5th. On June the  
14 12th Dr. Thomas said to me again that he considers it  
15 inappropriate that he appear here for any individual  
16 party, and that is the basis on which I'm making my  
17 request that the Board call him as the Board's witness.

18 And, Mr. Hanna, I hope that you can deal  
19 with that particular problem because my information on  
20 that was quite explicit.

21 MR. HANNA: My information is likewise  
22 quite explicit and, unfortunately, we are in that  
23 situation of having two explicit pieces of information  
24 that differ.

25 My information is that there are two

1 options in Dr. Thomas' view. His preference is clearly  
2 to come as a Board witness, he's been consistent about  
3 that since I've spoken to him over two years ago. He  
4 has indicated, however, there is another option; that  
5 is, the option that we have pursued and we have pursued  
6 it for an extended period of time, that's why I've  
7 submitted the correspondence that I have, this is not a  
8 new matter, this is a matter that we have been involved  
9 in for some time.

10 Dr. Thomas has clearly indicated to us  
11 the difficult situation he finds himself in in  
12 appearing for one of the parties, and I want the Board  
13 to be clear on that. Dr. Thomas sees that as a  
14 difficult position for him to be found in. He would  
15 prefer, the witness would prefer to come as a Board  
16 witness.

17 However, and this is -- I think I would  
18 like now to just explain to you why we have taken the  
19 route we have and; that is, we have been involved in  
20 the discussions with Dr. Baskerville, the Board's well  
21 aware, there were concerns raised by OFAH with respect  
22 to the scope and nature of the testimony that Dr.  
23 Baskerville would raise, there were number of  
24 submissions made to the Board in terms of difficulties  
25 with calling Board witnesses, some of the examples



1        were - and I believe Mr. Tuer spoke quite eloquently as  
2        he always does own this matter, as did other counsel -  
3        and he indicated the problems in terms of reply  
4        evidence, the difficult status of a Board witness in  
5        terms of the witness/Board relationship and how it's  
6        perceived, the difficulty of having a Board witness  
7        potentially usurp the powers of the Board in terms of  
8        basically taking over the decision-making process, the  
9        scope of the evidence, determining what the scope of  
10       evidence, what preparation the witness should  
11       undertake, and the difficulty of adequate preparation,  
12       particularly given that while the Board has obviously  
13       counsel that's quite conversant in the matter of  
14       environmental assessment, he hasn't been here on a  
15       day-to-day basis and it's very difficult for him to  
16       have a full understanding of the full scope of the  
17       evidence and nature of what has gone on and, therefore,  
18       to fully prepare a witness.

19                We recognize these difficulties. That  
20       was the reason the OFAH took the strategy it did. We  
21       were concerned about, if he came forward as a Board  
22       witness, No. 1, we couldn't assure that was going to  
23       happen, we were very concerned that Dr. Thomas comes  
24       before this Board and does give evidence, and so we  
25       pursued the second option and that's what I have laid



1 out to you in the package I have just submitted.

2 MADAM CHAIR: Mr. Hanna, are you  
3 absolutely certain that if the Board didn't extend an  
4 invitation to -- if the Board didn't ask Dr. Thomas to  
5 come as the Board's witness that you are absolutely  
6 convinced that he would come as a witness for the OFAH?

7 MR. HANNA: I'm as convinced as I can be.  
8 Actually the final conversation I had myself with Dr.  
9 Thomas I indicated -- as I say, I'll say it again, he  
10 said it very clearly to me, he said: Look, I'm in a  
11 difficult situation here. For example, he's the  
12 Chairman of the Committee on the Northern Spotted Owl  
13 which is a major issue in the Pacific Northwest in  
14 progress at the time, it's one where it's pitted a  
15 great number of groups and an extremely adversarial  
16 situation and he's quite concerned at being seen, even  
17 outside his jurisdiction as being biased in one way or  
18 another. And that's his concern about coming as a  
19 witness on behalf of one party or another.

20 However, I put to him the circumstance  
21 and I said to him, I said: Well, look, there's a  
22 possibility the Board may not opt to call you and my  
23 client is very concerned that your evidence is heard at  
24 the hearing. I said: Is there another option? And  
25 the other option is the one that I have explained to

1       you, it's the one that we have pursued from the  
2       beginning. Both of those options were put out to us by  
3       Dr. Thomas from the very first time that we approached  
4       him, and that's why we have pursued the second option.

5               All I can say, Madam Chair, is I have the  
6       correspondence, we have gone through all the steps that  
7       I know feasibly possible to ensure that, the only  
8       possible chink in the armour at this time, or the dam,  
9       whatever at this time, in my view, is that I don't have  
10      a formal - how should I say - written confirmation from  
11      Dr. Thomas saying that I will be there on such and such  
12      a day to give testimony on such and such a matter. I  
13      don't have that, but I have discussed with him what he  
14      would require to come as a Board witness and, as I say,  
15      we followed through that in every way that we possibly  
16      can.

17             So my understanding at this time is that  
18      he sees two options. His preference is the first;  
19      there is a second, we have pursued the second, I  
20      haven't got final confirmation from him as far as: Is  
21      the letter that I have submitted to you from Dr.  
22      MacLean adequate, but it's my understanding that that  
23      is a second option and one that we can pursue.

24             MADAM CHAIR: Okay. Ms. Seaborn?

25             MS. SEABORN: Madam Chair, perhaps if I

1        could make a comment. Ms. Swenarchuk alluded to  
2        conversations with the Ministry of the Environment some  
3        time ago. It's quite true that Forests for Tomorrow  
4        did approach us over a year ago and asked if we could  
5        supply a letter similar to the correspondence that has  
6        been referred to in this package introduced right now  
7        from MNR.

8                        We were quite prepared to provide that  
9        invitation and our advice to Ms. Swenarchuk at that  
10       time was that our indication should ask, as a  
11       provincial government agency, would Dr. Thomas be  
12       prepared to appear as a witness on behalf of Forests  
13       for Tomorrow?

14                      Now, that letter never went as far as  
15       going to Dr. Thomas because my further information from  
16       Ms. Swenarchuk, and what I have understood all along,  
17       is that had Dr. Thomas received that letter from the  
18       Ministry of the Environment it would not have changed  
19       his position with respect to appearing as a witness for  
20       the Forests for Tomorrow, it would not have helped his  
21       situation. That's why we are here today.

22                      There is still seems to be a difference  
23       of opinion. I'm not convinced, with the greatest  
24       respect, Mr. Hanna, that we have the answer and...

25                      MADAM CHAIR: You are telling the Board

1       that you think Dr. Thomas won't appear on behalf of any  
2       particular client, he will only come as a mutual  
3       witness.

4                   MS. SEABORN: Well, I'm not sure.

5                   MADAM CHAIR: You're not sure?

6                   MS. SEABORN: I'm not sure we have the  
7       answer and I say that with the greatest of respect, Mr.  
8       Hanna, but I'm just not sure we know today, and my  
9       suggestion is that we have Mr. Turkstra contact Dr.  
10      Thomas.

11                  MADAM CHAIR: I don't know. Dr. Thomas  
12      has been called by a lot of people.

13                  MS. SWENARCHUK: I'm a little concerned  
14      about that, Mrs. Koven, yes.

15                  MS. SEABORN: My concern was that, first  
16      of all, should the Board decide that it wishes to hear  
17      Dr. Thomas - and I think that is the first issue, the  
18      Board has to be convinced that it wants to hear this  
19      evidence - and should it decide that it wants to hear  
20      this evidence, I think that there does need to be  
21      established as to whether there is a guarantee beyond  
22      what Mr. Hanna is telling us today that Dr. Thomas will  
23      be hear, because...

24                  MADAM CHAIR: Well, let's face it. It's  
25      a lot easier from the Board's point of view for a party

1 to bring a witness to us.

2 MS. SEABORN: Well, exactly.

3 MADAM CHAIR: You know, if we don't have  
4 to entertain bringing a Board witness, that's an easier  
5 matter. If it's a matter of not being able to have a  
6 witness come before us this way, then we will have to  
7 look seriously at doing that, but the Baskerville  
8 experience was -- I think it worked rather well, but it  
9 was -- it's a lot of work and things that the Board  
10 would rather have parties do obviously. We're not  
11 competing to bring Dr. Thomas as our witness.

12 MS. SEABORN: No, exactly. And I  
13 understand that. But my concern is that --

14 MADAM CHAIR: Well, we have to know if  
15 indeed he won't, if he feels he can't, he can't appear  
16 on behalf of an individual party's interest.

17 MS. SEABORN: Exactly. And what we have  
18 to -- just one moment, Mr. Hanna, if I can finish and  
19 then I'll sit down. What we seem to have in front of  
20 us today, Madam Chair, is still a difference of opinion  
21 based on conversations two different parties have had  
22 with Dr. Thomas.

23 MADAM CHAIR: Well, I'm going to assume  
24 that it's all this confusion here.

25 MS. SEABORN: What's the story?



1                   MADAM CHAIR: Some one has got to  
2                   straighten this out obviously because we can't.

3                   MR. HANNA: Madam Chair, might I suggest,  
4                   with the greatest respect to Ms. Seaborn, that the OFAH  
5                   has gone to considerable effort in this matter to  
6                   determine Dr. Thomas' status. I think that the  
7                   appropriate step is not to involve Mr. Turkstra at this  
8                   point, I think the appropriate step is for us to see if  
9                   we can secure the written agreement of Dr. Thomas to  
10                  appear here on behalf of the OFAH.

11                  MR. MARTEL: Well, can I cut in there,  
12                  because at that stage of the game - let's stop for a  
13                  moment, because what you're doing, we've got a  
14                  difference of opinion of two different witnesses and  
15                  what you're I think attempting to do, Mr. Hanna, is get  
16                  your oar in first, and Mrs. Koven and I have talked  
17                  about this.

18                  There is obvious confusion, we don't want  
19                  to pit one party against the other, and that -- it  
20                  seems to me that if you say I'm going to go and do it,  
21                  Ms. Swenarchuk can do exactly the same thing, and we  
22                  have a witness sitting out there who really doesn't  
23                  know, I think, which foot he's going to put forward  
24                  next based on the two different opinions we have now.

25                  And I simply want to get -- I think we

1       should ask Mr. Turkstra, it's my opinion, only to this  
2       extent: To find out what in fact Dr. Thomas' position  
3       really is, it's neutral, and then we can turn you loose  
4       and you can fight with each other or do what you want,  
5       but up to that point I think we just have to hold this,  
6       and my opinion would be -- or my position, though I  
7       haven't asked my colleague what her position is - would  
8       be to ask Mr. Turkstra to find out exactly what's going  
9       on, because the rest is useless at this point.

10               MR. HANNA: Mr. Martel, the only point  
11       that I would make there is that I've submitted to the  
12       Board the correspondence and material that's led up to  
13       this as evidence of the effort that has taken place.

14               I do not - and I want this to be on the  
15       record and make it very clear to the Board - that it's  
16       not a matter of getting our oar in first. We have  
17       taken this step for one reason and one reason only, and  
18       that is, we want to be able to ensure that Dr. Thomas  
19       was going to come and give evidence at this hearing.

20               I could not assure that, by relying on  
21       the Board calling him, that's with the greatest respect  
22       to the Board, it's just the Board's prerogative and I  
23       can't assure that. I could by the other alternative  
24       and that's why I've pursued it.

25               MR. MARTEL: Would you agree though that

1 Ms. Swenarchuk was attempting to pursue the same  
2 position with MOE, so in fact both of you are  
3 attempting to achieve the same thing.

4 Her information was: Cut it off at the  
5 pass, don't get the letter from MOE because Dr. Thomas  
6 will only come with an invitation. I mean, I think  
7 that is what Ms. Seaborn told us not ten minutes ago.  
8 So in fact both of you were pursuing exactly the same  
9 thing, I would suspect.

10 MR. HANNA: But there is a difference,  
11 Mr. Martel.

12 MR. MARTEL: What's the difference?

13 MR. HANNA: That is, we didn't cut it off  
14 at the pass, we took it forward, we did get  
15 confirmation from the U.S. Forest Service, we have  
16 carried it through, we did get the letter of  
17 authorization from Ministry of Natural Resources who is  
18 the proponent in this case, we have taken it that far.

19 I suggest that, or I submit to the Board  
20 that the position of the OFAH is quite different than  
21 the situation of Forests for Tomorrow in this  
22 particular matter, we have carried it forward. Why  
23 Forests for Tomorrow decided not to, I don't care. The  
24 point is, Mr. Martel and Madam Chair, is that Dr.  
25 Thomas should be here at this hearing as far as the

1 OFAH is concerned.

2 Now, if it's going to be as a Board  
3 witness, I'mn quite prepared to say, if the Board  
4 wishes to call Dr. Thomas, well then that's the best --  
5 that will be the way he would go, because that's the  
6 preference of the witness. And I do see difficulties  
7 with that and I have outlined those difficulties. I  
8 think it's quite a burden to put on Mr. Turkstra but if  
9 that's the preference of the witness and that is going  
10 to be the best way to do it, then I can tell you the  
11 OFAH will not object to that.

12 MR. MARTEL: I don't think I said that,  
13 Mr. Hanna. I think I said I just wanted to have Mr.  
14 Turkstra confirm which position is the right one. I  
15 think that's as far as to the extent I went.

16 MR. HANNA: I understand.

17 MS. SWENARCHUK: Madam Chair?

18 MADAM CHAIR: Yes, Ms. Swenarchuk?

19 MADAM CHAIR: Excuse me, Mr. Hanna. You  
20 will be able to finish your point.

21 MS. SWENARCHUK: I would just like to  
22 point out that we were told explicitly by Dr. Thomas  
23 that a letter stronger than the letter from Mr. MacLean  
24 of yesterday would not be sufficient for him to obtain  
25 permission, that is the letter that Mr. MacLean wrote



1 yesterday indicated that he has no objection to Dr.  
2 Thomas appearing as part of the OFAH case.

3 What we were told was that Dr. Thomas  
4 needed an explicit invitation from an Ontario  
5 government agency, and we were told the same thing with  
6 regards to Mr. Mazer. So we didn't - I'm not sure what  
7 the analogies are here, something about drop it off the  
8 pass or something - we took the route that, in our  
9 view, Dr. Thomas had told us we needed to take.

10 MR. HANNA: Madam Chair, unfortunately --

11 MR. CASSIDY: Can I make some submissions  
12 in this regard, Madam Chair, from a party who has no  
13 oar to put in and nothing to cut off at the pass.

14 MADAM CHAIR: Yes. One moment, Mr.  
15 Cassidy.

16 Mr. Hanna, do you have just one thing to  
17 add?

18 MR. HANNA: I would simply say that the  
19 information I have just presented to the Board  
20 contradicts what Ms. Swenarchuk said, in fact that  
21 letter was adequate for the Director of the U.S. Forest  
22 Service to provide authorization for Dr. Thomas to  
23 come. So it's unfortunate she didn't feel that would  
24 be adequate. It seems that the director thought  
25 otherwise and has given his approval, which is the



1 letter of January 30th, 1990 and a subsequent letter  
2 from Dr. Quinney which confirms the telephone  
3 conversation they had just some four or five days ago.

4 MADAM CHAIR: Mr. Cassidy, did you  
5 have --

6 MR. CASSIDY: Yes, and I'm speaking on  
7 behalf of a party who takes no position in regard to  
8 whether or not a particular witness should be called as  
9 an expert, by the Board. I do, however, speak from  
10 - some principles which I think we have to remember here  
11 which may assist you in deciding how to fathom out what  
12 appears to be a rather confusing state of affairs.

13 It's my view that it is the parties who  
14 bring the evidence before the Board and that is the  
15 general presumption of any judicial proceeding or  
16 quasi-judicial proceeding, and therefore it is the  
17 party's responsibility to arrange for a witnesses, who  
18 may or may not prefer to be witnesses, but will come if  
19 the proper circumstances exist, either by way of  
20 subpoena or by way of invitation from someone.

21 It, therefore, in my view, is entirely  
22 correct what Mr. Martel says, the first issue that has  
23 to be decided is: Can any party get him here as a  
24 witness. If that question is answered affirmatively,  
25 in whatever way that is done, that to me ends the

1 matter, and the second issue is: If that is not the  
2 case, then the Board has to decide: Do we need that  
3 witness, just like we did with Dean Baskerville.

4 You'll recall that the former Chairman  
5 canvassed the parties on at least two occasions that  
6 I'm aware of: Is anyone going to call him, and then  
7 when the answer was received: No, no one intended to  
8 call him as part of their evidence, then the next issue  
9 our was canvassed: Is anyone in disagreement that we  
10 need this person as a witness?

11 With those principles in mind I think it  
12 is incumbent upon either Forests for Tomorrow or the  
13 Anglers & Hunters to sort out if he will come and get  
14 that sorted out either through their own offices by way  
15 of coming with a definitive statement from Dr. Thomas:  
16 Yes, I will come as part of your case, you get the  
17 paperwork sorted out, or: No, I will not come as part  
18 of your case because I have some restriction.

19 And therefore, because this is a foreign  
20 matter he cannot be subject to a subpoena in Ontario,  
21 it would then be open to the Board to exercise that  
22 second option if Dr. Thomas says I will come by way of  
23 invitation from the Board only. Then the Board would  
24 then have to make the decision: Do we need this person  
25 as a witness, and I have some comments in respect of

1           that issue which maybe I can make now or make later.

2                       I would suggest in those circumstances,  
3           if you proceed as I suggest you do in making that  
4           decision, that the Forests for Tomorrow or the Anglers  
5           & Hunters come back to you at some stage, presumably  
6           early next week, with a definitive letter from whoever,  
7           I'm sorry, from Dr. Thomas at whoever's prompting  
8           deciding where he says: Yes, I will come at the  
9           invitation of a party because, in my respectful  
10          submission, once that is done and appear as part of a  
11          party's case, that's the end of the matter and the  
12          Board need not entertain the next question of whether  
13          or not they should call him.

14                      The substance of my remarks, Madam Chair,  
15          is that it's an extraordinary remedy, in my view, for  
16          the Board to call a witness.

17                      Section 30 that you have in your Rules, I  
18          think, is a special ruling that is designed to get  
19          around situations where you have an inability to have a  
20          witness before you, but you decide you need him. But  
21          we don't have any clear evidence that you have that  
22          inability right now.

23                      Now, I have no objection to Mr.  
24          Turkstra - I have some sympathy for Ms. Swenarchuk's  
25          position that you might be entering a third person into

1 the body of water - but you know, as a Board counsel  
2 maybe he is the one to do it because it can be  
3 explained very simply to Dr. Thomas.

4 MS. SWENARCHUK: We agree with that  
5 proposal.

6 MADAM CHAIR: Well, I think the best --  
7 yes. I think what we will do is we will have Mr.  
8 Turkstra discuss this with Ms. Swenarchuk and Mr. Hanna  
9 and they can work out a way that that can be done.

10 MS. SWENARCHUK: I have tried to reach  
11 him but haven't been able to for exactly that reason.

12 MR. CASSIDY: If I might make the  
13 following suggestion as well, that it would seem to me  
14 that the very same procedure should be adopted with  
15 respect to Mr. Mazer since they seem to be in the same  
16 position, and I would also take the position - and  
17 again this is without saying -- without commenting on  
18 Dr. Mazer or Dr. Thomas at all - because the Board  
19 may -- the issue of whether or not they find it helpful  
20 does not even have to be decided if one of the parties  
21 is able to call him as a witness.

22 And it's all a recognition of what you  
23 put your finger on, Madam Chair, that this is a matter  
24 for the parties to bring evidence to you, not for you  
25 to generate evidence.



1 MADAM CHAIR: With respect to Mr.  
2 Mazer --

3 MS. SWENARCHUK: He informed me that he  
4 did not consider it appropriate that he appear for a  
5 party and, again, that is why I made a request to the  
6 Board to call him.

7 MADAM CHAIR: All right.

8 Mr. Hanna, Ms. Swenarchuk, I don't think  
9 there is any way of getting around this other than  
10 having a piece of paper in front of the Board signed by  
11 Dr. Thomas and Mr. Mazer.

12 MS. SWENARCHUK: It's most unfortunate  
13 that he should be subjected to this, but I guess you're  
14 right.

15 MADAM CHAIR: I think that's the only way  
16 to do it and the Board will instruct our counsel to  
17 discuss this with you, to come up to an arrangement  
18 whereby if Mr. Turkstra is agreeable, he can get in  
19 touch with Dr. Thomas and Mr. Mazer, or you can think  
20 of some way of not confusing these potential witnesses  
21 further.

22 MS. SWENARCHUK: Well, I would appreciate  
23 if you would make the request of Dr. Turkstra that he  
24 do that.

25 MADAM CHAIR: Mr. Turkstra.



1 MR. MARTEL: He's just been elevated.

2 MADAM CHAIR: We will talk to Mr.

3 Turkstra first thing in the morning.

4 MR. CASSIDY: If might I also add, Madam  
5 Chair, and just repeat my submission that, in my view,  
6 that doesn't end the issue. You then have to be  
7 satisfied that his evidence would be of assistance to  
8 you, and I'm not taking any position in that respect,  
9 that's a matter for the Board to decide, but simply --  
10 it would be my submission, however, that simply because  
11 a person is qualified and maybe even considered the  
12 eminent expert in the field may not be sufficient for  
13 the Board to simply decide: Well, we're going to call  
14 him as an expert.

15 But I may have more to say about that  
16 later, if we have to deal with the issue.

17 MADAM CHAIR: I think certainly the Board  
18 will -- let's sort out this.

19 MR. CASSIDY: Yes.

20 MADAM CHAIR: And then we will hear  
21 submissions on the reasons the Board would need to call  
22 both of these gentlemen.

23 MR. CASSIDY: In the event that it need  
24 to.

25 MR. HANNA: Madam Chair, if I might. I

1 don't see any reason why the discussion on Mr. Mazer  
2 should be suspended given the circumstances.

3 MR. MARTEL: We'll only hear it once,  
4 we're not going to hear it twice.

5 MR. CASSIDY: It's the same position.

6 MR. MARTEL: Yes.

7 MR. CASSIDY: If they are in the position  
8 where they will come, given the invitation on behalf of  
9 a party, then it would presumably be up to that party  
10 to go through the bureaucratic steps to get him here.

11 MS. SWENARCHUK: I have already explained  
12 what Mr. Mazer told me with regard to that issue and I  
13 would just as soon proceed with --

14 MR. CASSIDY: The witnesses are in a  
15 position where they may not want to testify either.  
16 Again, I am not taking a position with respect to Mr.  
17 Mazer, but witnesses' preferences are not determined by  
18 this panel.

19 MADAM CHAIR: The Board would like to see  
20 a letter from both of these potential witnesses  
21 outlining the terms under which they agree to appear at  
22 this hearing.

23 MS. SWENARCHUK: All right. Then there  
24 is no point in proceeding with the matter with regards  
25 to Mr. Mazer this afternoon.

1                   MADAM CHAIR: I think not. I think we  
2 have simply got to find out whether they will come at  
3 the invitation of Forests for Tomorrow or OFAH or  
4 whether the Board will then have to consider whether  
5 there's justification to, or whether there's a need for  
6 us to invite them.

7                   MS. SWENARCHUK: Very well.

8                   MADAM CHAIR: All right.

9                   MR. CASSIDY: Can I raise two other  
10 unrelated matters, Madam Chair?

11                  MADAM CHAIR: Does anyone have anything  
12 to -- Mr. Freidin, do you have anything to say on this  
13 issue?

14                  MR. FREIDIN: No, I think enough has been  
15 said.

16                  MS. SWENARCHUK: Madam Chair?

17                  MADAM CHAIR: There is -- sorry, Ms.  
18 Swenarchuk, there is one thing, is this --

19                  MR. CASSIDY: I apologize, I thought we  
20 were done dealing with this. I didn't mean to cut you  
21 off.

22                  MADAM CHAIR: Not quite, not quite. Do  
23 Dr. Thomas or Mr. Mazer require a formal letter of  
24 invitation from the Ministry of Natural Resources -- or  
25 from us rather, do you think they require anything from

1 us before they will give you a written agreement about  
2 whether they are going to appear or not, or do you  
3 think they will be -- Mr. Turkstra can intercede and  
4 sort this out?

5 MS. SWENARCHUK: With regard to Dr.  
6 Thomas?

7 MADAM CHAIR: Mm-hmm.

8 MS. SWENARCHUK: Well, in my conversation  
9 with him on June the 12th the first thing he said to me  
10 is: You people have really confused me.

11 MADAM CHAIR: Well, his head must be  
12 swimming.

13 MS. SWENARCHUK: So I'm sure Mr. Turkstra  
14 can sort that out.

15 MADAM CHAIR: All right.

16 MS. SWENARCHUK: With Mr. Mazer, I don't  
17 think anyone else has been harassing him with phone  
18 calls. I should be able to sort that out.

19 DR. QUINNEY: I beg your pardon?

20 MS. SWENARCHUK: That was meant not  
21 seriously, Mr. Quinney.

22 MADAM CHAIR: Is this agreeable to you,  
23 Mr. Hanna and Dr. Quinney, if we ask Dr. Thomas to  
24 write down his understanding how he wishes to appear at  
25 this hearing?

1                   MR. HANNA: Madam Chair, it's certainly  
2 agreeable as far as I know. I obviously have to  
3 discuss it with Dr. Quinney, but I don't believe there  
4 is any problem.

5                   The only point that I would raise is that  
6 I do believe that the material that I have put before  
7 the Board indicates that the OFAH has taken steps  
8 beyond any other party in this hearing to secure Dr.  
9 Thomas as a witness here, and I think that it's only  
10 fair that the OFAH follow through with that, see what  
11 the outcome of it is, and I'll undertake to the Board  
12 to do that, report to you as expeditiously as I  
13 possibly can, and at that point then the Board would be  
14 in a position to determine whether or not further  
15 submissions on having him called as a Board witness are  
16 necessary.

17                  MADAM CHAIR: All right. I intend  
18 tomorrow morning to call Mr. Turkstra and have him get  
19 in touch with you and Ms. Swenarchuk very quickly and I  
20 assume there will be no communication with Dr. Thomas  
21 until you discuss this with Mr. Turkstra?

22                  MS. SWENARCHUK: Fine.

23                  MR. HANNA: Certainly.

24                  MADAM CHAIR: And then sort out how we  
25 will next contact him.



1 MS. SWENARCHUK: May I just point out,  
2 Madam Chair, that given that our case is being prepared  
3 now, the resolution of this issue and timing of it is  
4 very important to us.

5 MADAM CHAIR: It has to be done quickly.

6 MS. SWENARCHUK: And I might just point  
7 out that the sooner Dr. Thomas appeared the less  
8 evidence we might have to deal with on wildlife, so  
9 that might be a factor as well.

10 MR. HANNA: Madam Chair, I think with  
11 respect to that matter though there is a point that  
12 should be put on the record and; that is, I am  
13 surprised that this matter is being raised at this  
14 point. If this was an issue, I see no reason why it  
15 should have been raised at this point. If it was a  
16 concern, it could have been raised a long time ago.

17 If this information was available to Ms.  
18 Swenarchuk, I'm somewhat perplexed by why this was  
19 brought forward at this point, and I just raise that  
20 because I'm willing to move as quickly as I possibly  
21 can on this, but by the same token it does perplex me  
22 somewhat why it was raised at this point.

23 MADAM CHAIR: All right. We've got  
24 one -- are we finished discussing the matters of --

25 MS. SWENARCHUK: I would just add then a

1 request that we return here to determine this matter as  
2 soon as possible.

3 MADAM CHAIR: Yes. Mr. Hanna, I don't  
4 think we're going to -- we're collecting correspondence  
5 here. Why don't we hold on to the correspondence and I  
6 am not going to make it an exhibit tonight, we will  
7 keep it together, the Board has it.

8 MR. HANNA: Fine.

9 MR. CASSIDY: Just two other minor  
10 matters, Madam Chair. I have had the opportunity to  
11 review the proposed schedule with Mr. Cosman who is  
12 handling Panel 10 and he advises that he has confirmed  
13 that the June dates that you have selected are -- the  
14 witnesses are entirely available.

15 He's in the process of confirming - as of  
16 three o'clock he was when I last spoke to him - the  
17 August dates that you had indicated, and he does not  
18 anticipate any difficulties whatsoever, but if there  
19 are, we will advise the Board forthwith with respect to  
20 the scheduling of those witnesses for those dates.

21 The third matter he wished to have me  
22 indicate to you was what appears to be the implication  
23 of the OPFA who would be calling their evidence during  
24 that week of August 13th, 14th and 15th.

25 I had a conversation with Ms. Devaul,

1 subsequent to my conversation with Mr. Cosman, and she  
2 indicated that her indication -- her words from the  
3 OPFA was that they do not intend to call any evidence.

4 I can indicate that if they do change  
5 their minds we would be objecting to them calling their  
6 evidence during the middle of our Panel 10, as I am  
7 sure you can appreciate, and would ask that they be  
8 asked to call their evidence after.

9 MADAM CHAIR: I believe the matter is as  
10 stands as Ms. Devaul has asked for a written  
11 understanding from the OPFA that they won't be calling  
12 evidence.

13 MR. CASSIDY: All right, thank you.

14 The only other matter I wish to raise and  
15 wish to indicate was that I had a conversation with Ms.  
16 Swenarchuk today in which I indicated that I was going  
17 to be seeking some further clarification of the outline  
18 of her evidence and she agreed to provide that to me,  
19 so -- in light of the outline that she provided to the  
20 Board.

21 And those are the only other comments I  
22 had to make.

23 MADAM CHAIR: All right. Mr. Hanna, I  
24 would inform you that we are working on schedule  
25 changes in order to accommodate the Panel 10 evidence.

1 MR. HANNA: Yes, Madam Chair.

2 MADAM CHAIR: And there is a tentative  
3 schedule available if you want to take a look at it.  
4 You can get it from Ms. Devaul.

5 MR. HANNA: Thank you very much.

6 MADAM CHAIR: I don't think we can go  
7 much farther with the scheduling tonight then, but  
8 that's the way it looks.

9 MR. CASSIDY: We are going to proceed on  
10 the basis that this is the schedule from here on in.  
11 Madam Chair, and have our witnesses available.

12 MADAM CHAIR: All right. Thank you very  
13 much.

14 ---Whereupon the hearing adjourned at 5:55 p.m., to be  
15 reconvened on Tuesday, June 19th, 1990, commencing  
at 9:00 a.m.

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